ABQ THE PLAN: THE RIO GRANDE VISION

CONNECT AND PROTECT

Photo Credit: Bill Tondreau

Research and Analysis

Prepared for the Mayor's Office, City of Albuquerque
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executive summary

Connect and Protect is the theme for the Rio Grande Vision Project - an initiative of the Mayor's office to identify improvements and programs along the river corridor that help make the river a bigger part of people's lives. . By deliberately creating new opportunities for public interaction with the river, more people will begin to see the Rio Grande as both an amenity and a resource, and these same people will become stewards of the River – protecting it for generations to come. This report is comprised of preliminary research that will contribute to the next stages of the project – concept development and implementation strategy.

Mapping

Geographic Information system (GIS) data gathered from the City of Albuquerque, the Middle Rio Grande Conservancy District (MRGCD), and the U.S. Army Corp. of Engineers (COE) has been compiled into preliminary data and composite maps. The focus of the mapping is connections and areas to be protected, including land use, jurisdictions, points of access, water conveyance and flood control facilities, trails and paths, roads, bus stops and restoration areas. These maps serve as resources for the planning team and were used in public meetings and interviews to solicit site specific information from stakeholders and participants. Photos taken across the site have been used to supplement the maps, and as new information is documented and concept development proceeds, the level of detail on these maps will continue to increase in areas where improvements are planned.

Comparable Cities

River cities with metropolitan area populations comparable to Albuquerque have been identified. This data will allow comparisons and help focus ongoing research related to trends in recreation, operations structures and funding for improvements. Western cities close in population to Albuquerque include Des Moines IA, Wichita KS, Stockton CA, Bakersfield CA, Omaha NE, Tulsa OK, and Boise ID.

River Activities

Based on an understanding of uses and operations on rivers in other communities, the project team is confident that the Rio Grande in Albuquerque could support multiple restaurants and boat/bike rental concessions. The key will be finding the right sites. One obvious location is on the east side of Central Avenue, in order to take advantage of the energy already present in association with the ABQ BioPark.

Recreation Participation

Projections for participation in recreation activities associated with the river suggest that more trail facilities are warranted. Additionally, since Albuquerque has not really promoted water based activities, connection points are hard to find and boat facilities are almost non-existent, the project team is confident that participation rates could be significantly higher than projected for these activities.

River Cities – Wild as a Differentiators

It appears that Albuquerque may have more "wild" river corridor than any other comparably sized city. Since protecting the river and the bosque are one of the objectives of this project, using the "wildness" as a differentiator and a unifying concept in any improvements may be a way to create a cohesive and exciting plan for the Rio Grande Vision.

project introduction

Albuquerque's Rio Grande Vision is about connecting Albuquerque to the river, and protecting the spectacular amenity and resource that flows through the heart of our community. The Rio Grande Corridor in Albuquerque is a hidden ecological jewel that needs to be seen and experienced in order to be fully appreciated by the community and protected for future generations. The Mayor's Office is leading a team of planners, engineers, designers, scientists and economists who will be evaluating conditions along the river. The planning team will be reaching out to the community to learn more about the Rio Grande in Albuquerque, and then developing concepts that will protect the Rio Grande while making it an integral part of people's lives.

ABQ the Plan is a city-wide public project/public investments plan that will spur private investment, improve quality of life for residents, promote tourism and bring new dollars to Albuquerque, enhance economic development and bring new jobs to Albuquerque. The Rio Grande Vision project is one of several ABQ the Plan initiatives designed around a new Vision for Albuquerque as a great outdoor city, a city of innovation and creativity, and a sustainable community.

project statement

1. Vision – bring the river more into our lives
2. Goals - Connect and Protect
   A. river to become more of a part of our local communities' daily lives through strengthening community links and public access to the City's waterfront
   B. become a more frequent destination for our visitors for the River
   C. improve the river environment and to foster a better understanding of it
3. Project objectives
   A. better access to river
   B. environmental stewardship
   C. excellent quality of life for residents and visitors
   D. quality recreation and amenities that might include, but are not limited to trails, biking picnic areas, more water and restrooms, overlooks and wildlife viewing, paddling (kayaking/ canoeing/rafting/paddle board) facilities and access, concerts, outdoor fairs, eco-zones (ecological/economic focused development zones, opportunities for food and recreational vendors)

Canoeing

Rio Grande Botanic Gardens

research and analysis

This first phase of the Rio Grande Vision project was about collecting information and trying to better understand the river and the potential for recreation and economic development improvements in and along the corridor. For this 22 week planning project on a wild urban river corridor, we knew that analysis paralysis might be a problem. We made a deliberate decision to focus research that was directly related to the objectives of the project - to connect and protect.

First, we decided to cast a broad net and analyze some of the most basic aspects of the area - jurisdiction, land use, the street network, trails, parking area, city land, open space and parks, flood control and irrigation facilities, and all existing physical connections to the river from the surrounding city. Concurrently, we decided that it was unlikely that we would propose major development within the levees unless it was in already disturbed areas, and this led us to focus more research attention on the crossings. After over 20 interviews with local subject matter experts from both the public and private sector, we started to gain an understanding of river water, river jurisdictions, river regulations, inter-agency partnerships and specific agency and organization advocacies. After that we circled back to specific agencies and organizations to identify ecologically sensitive areas and understand the conflicts between habitat preservation and community safety for a wildland urban interface. This work is ongoing.

The planning team has learned a lot about from river managers and stakeholders - about their passions for their jobs, organizational missions, their projects and the lack of coordination that is in some ways hindering river protection as well as public connection to the river. Research has also provided new insights on regulations and pending changes to policy, like the upcoming biological opinion on the Rio Grande Project, that may change how and when water flows along the river in Albuquerque. We know more now about existing conditions along the river, about ownership and about the potential for recreation in the corridor. We have also looked outside the river corridor and outside of New Mexico in search of precedents for river-related amenity development that might apply to the Rio Grande where it flows through Albuquerque.

As we move into the Concept Development Phase and identify prototype projects, we will reach out to project steering committee and technical committee members for information and guidance. Land and water managers as well as business people, scientists, planners, cyclists and birders are represented on the committees. This diversity of advocacies should help the team develop well considered concepts for new amenities that will both Connect more of the community to the river and Protect the river and the bosque for future generations.

Paseo del Bosque images

river crossings

bridges

nature center

Paseo del Bosque - Central

mapping

The maps on the following pages have been created from a variety of sources and will continue to evolve over the course of the project.

GIS data from the City of Albuquerque and the Middle Rio Grande Conservancy District have helped to form a graphic representation of physical, jurisdictional and ownership conditions in and along the river. This GIS data and the underlying aerial are the foundation of the mapping. But GIS data is not always accurate and we have begun to use other data sources and field observation to increase accuracy - especially in locations where the potential for adding new amenities is high. The City of Albuquerque Fire Department provided exceptionally detailed information directly related to the concepts of Connect and Protect - jurisdictions, access roads, bridges, jettyjack locations, hydrants, irrigation canals, drains and levees, open space tracts, and restoration sites. The Bosque Ecosystem Monitoring Program provided locations of their long term ecological monitoring sites. The Bureau of Reclamation provided information on river maintenance monitored sites in the Albuquerque reach, and expects to release new data that may help identify channel morphology and volumetric changes in the floodplain. We are also working with the Corp. of Engineers to determine the best information available for documenting eco-system characteristics such as the various types of habitat, variations in plant composition and vegetative density.

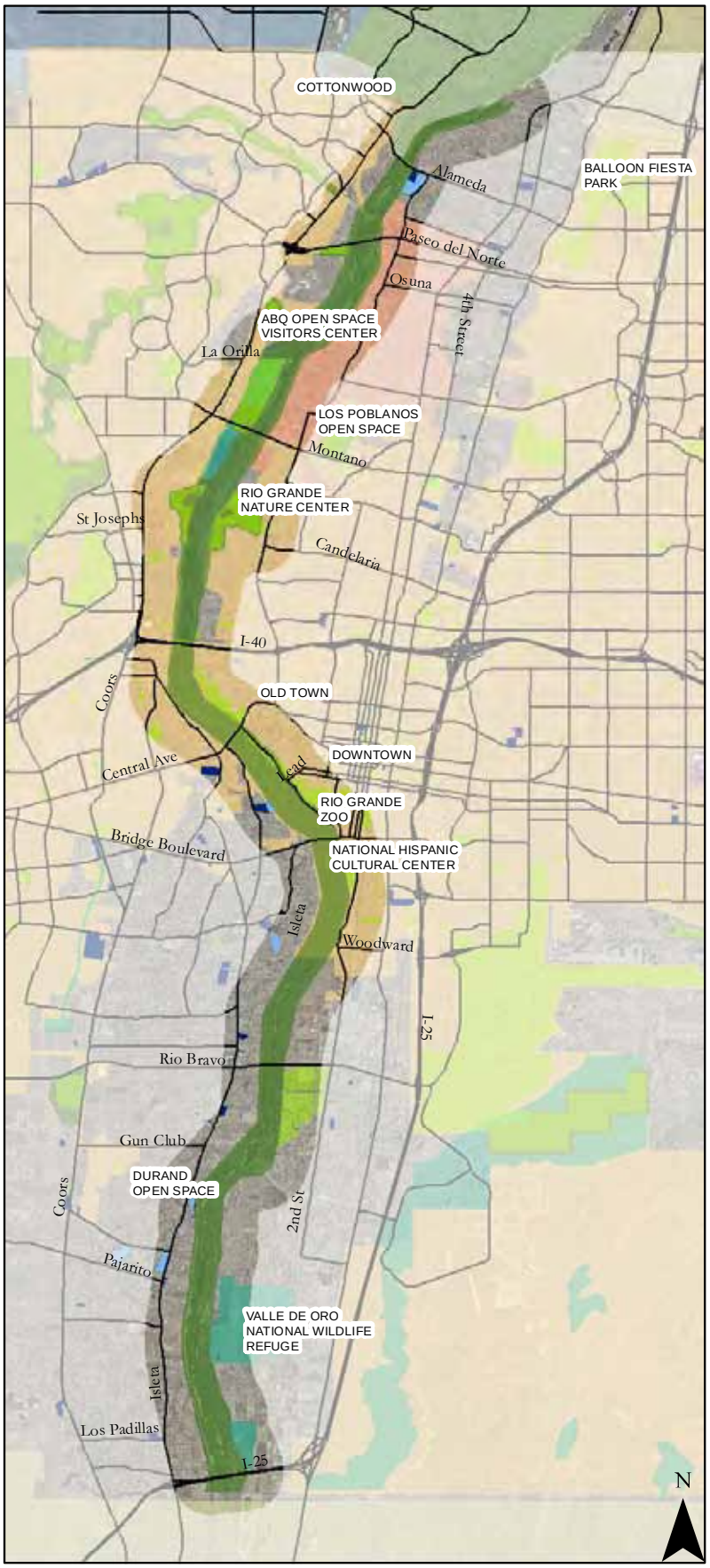
This collection of information has helped the project team better understand conditions along miles of river corridor edges in the Albuquerque metropolitan area. Good, accurate information will lead to informed decisions during concept development.

(top) jurisdiction map
(bottom) bosque wild land urban interface fire run book

GIS composite maps

open space locations, ownership and jurisdictions

This map was created to identify open space near or in the corridor, and to provide information on open space jurisdiction.



LEGEND

- Open space - County
- County-owned
- Indian reservation
- City-owned property

Open Space

- City-owned open space
- County-owned open space
- Federally-owned open space
- Proposed open space

Jurisdiction

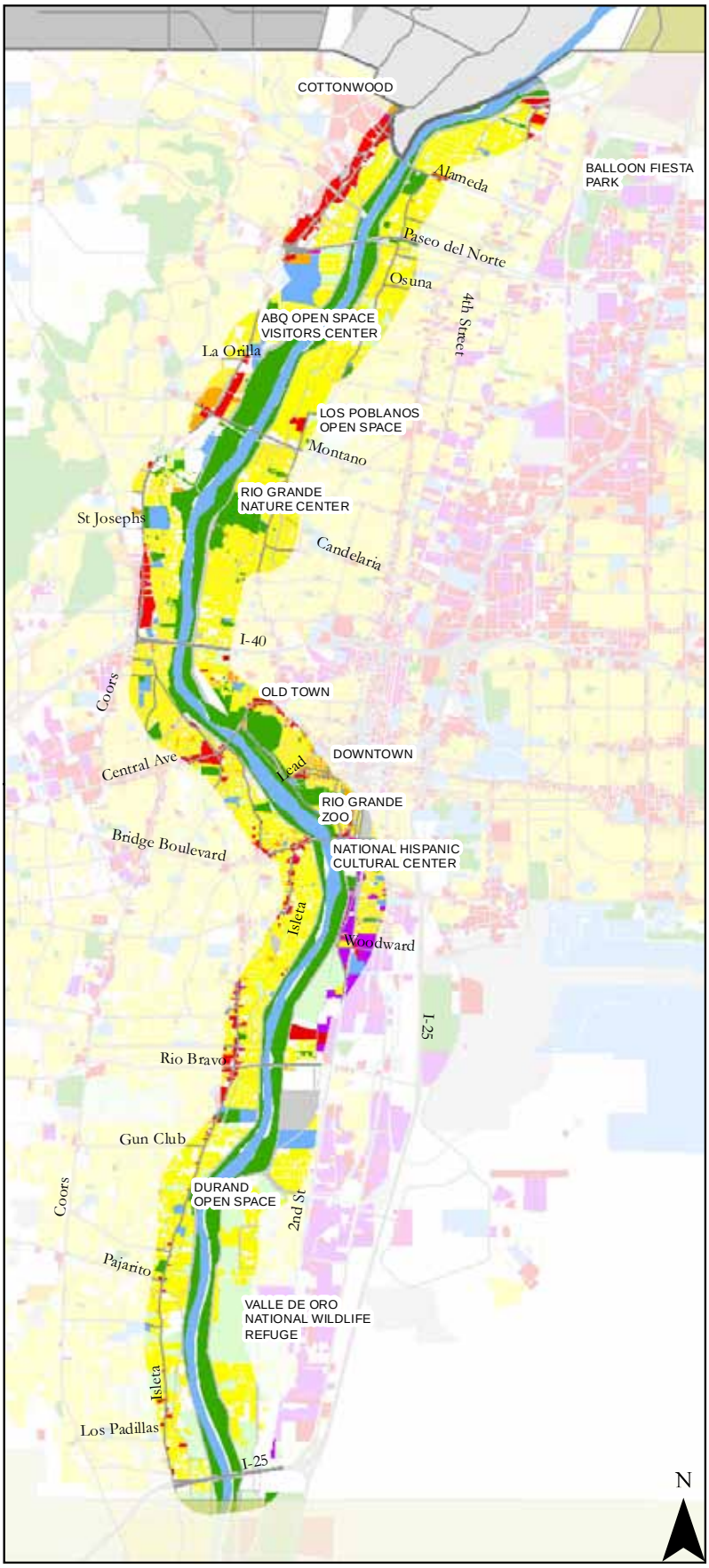
- Albuquerque
- Corrales
- Los Ranchos
- Rio Rancho

Miles

0 1.25 2.5 5

land use

This map was created to help identify areas that might be suitable for other uses besides recreation.



LEGEND

Land Use

- Agriculture
- Commercial Retail
- Commercial Service
- Drainage / Flood Control
- Industrial / Manufacturing
- Multi Family
- Parking Lots / Structures
- Parks / Recreation
- Public / Institutional
- Single Family
- Transportation / Utilities
- Vacant / Other
- Wholesale / Warehousing

Jurisdiction

- Corrales
- Rio Rancho
- Indian Reservation

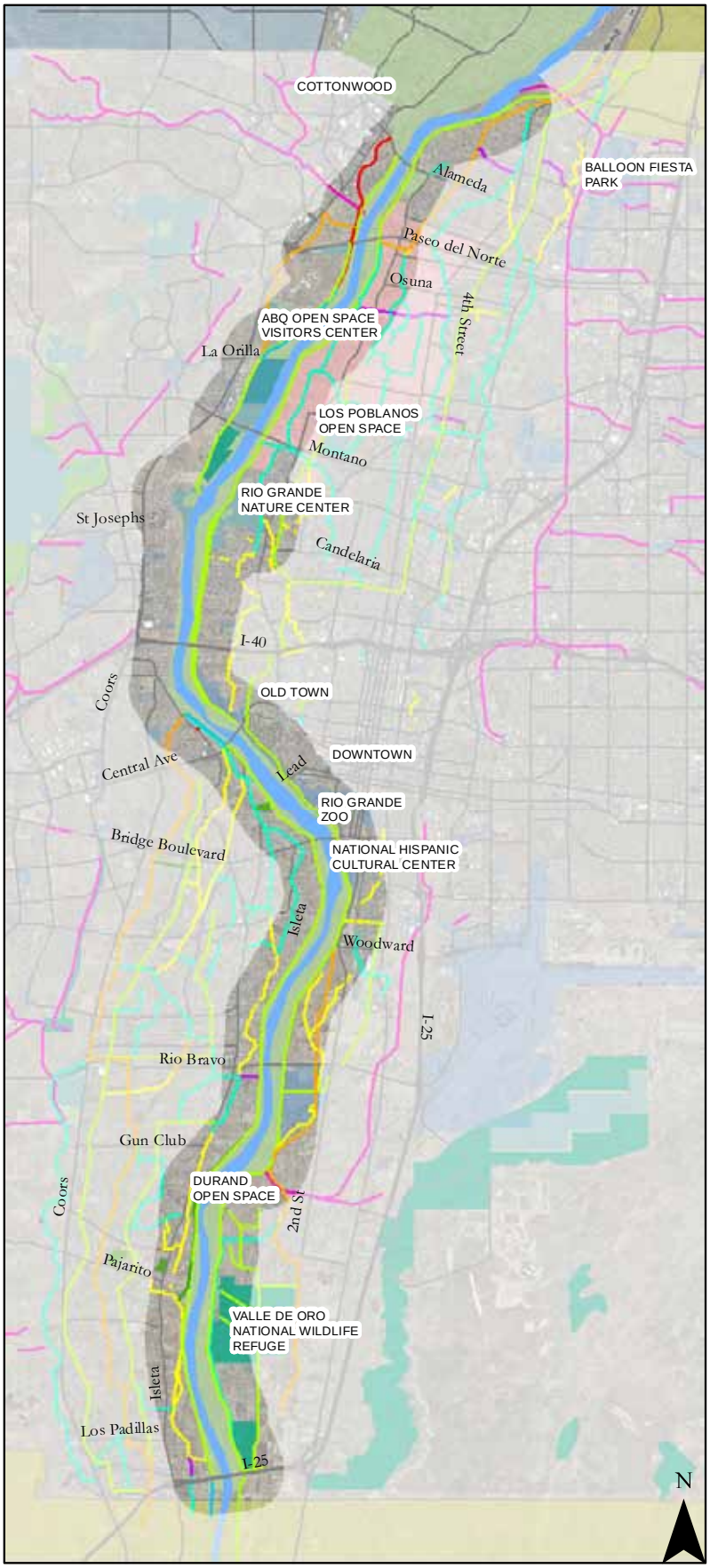
Miles

0 1.25 2.5 5

GIS composite maps

water conveyance, flood protection facilities, and open space

This map begins to illustrate all of the water infrastructure in the corridor. Some facilities like levees and ditches stacked with fish serve as recreation facilities. Some facilities like drains, ditches, and levees are barriers to connecting people to the river.



LEGEND

- Acequia
- Canal
- Ditch
- Drain
- Feeder
- Lateral
- Levee
- Wasteway
- AMAFCA/ABQ flood control
- City-owned property
- City-owned open space
- County-owned open space
- Petroglyph Nat'l Monument
- Proposed open space

Jurisdiction

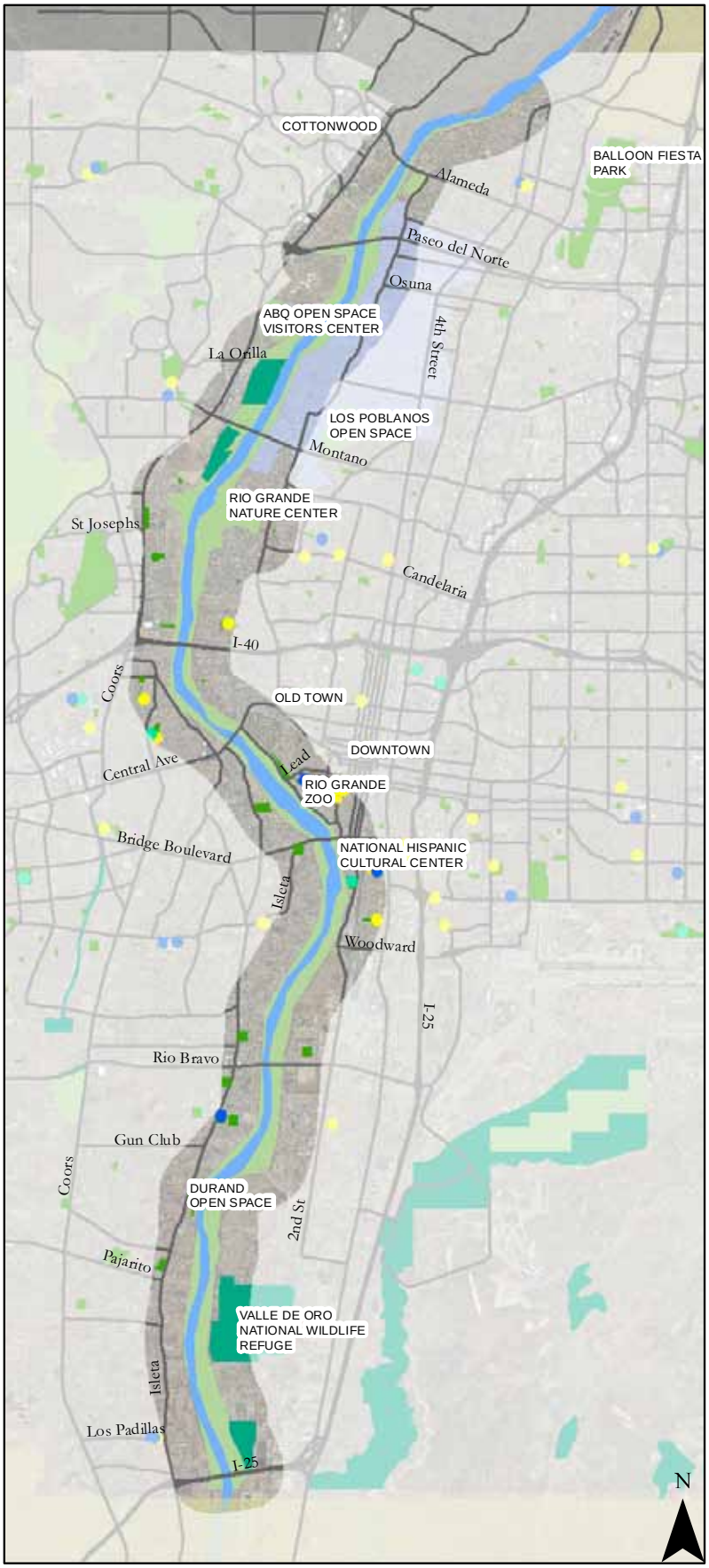
- Corrales
- Rio Rancho
- Los Ranchos
- Indian Reservation

Miles

0 1.25 2.5 5

community centers, recreation facilities and open space

This map illustrates many of the public amenities near the corridor. Facilities represent public investment and programs that might benefit from the synergy that river corridor improvements could provide.



LEGEND

- City Community Center
- City Multi-Service Center
- City Senior Center
- City Pool
- City Softball Fields
- parks
- County Community Centers
- County Parks
- County Pools

Open Space

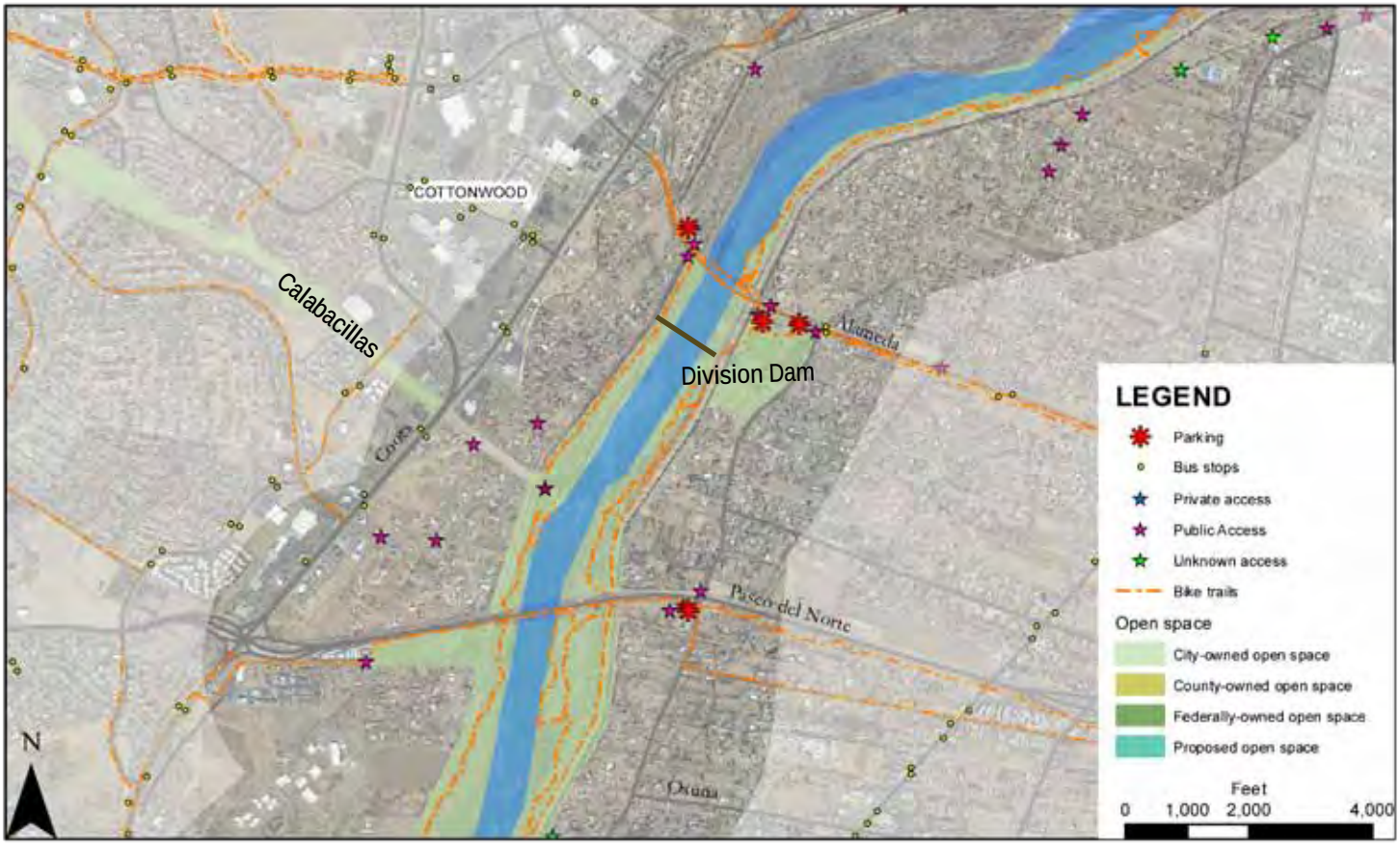
- City-owened open space
- County-owned open space
- Petroglyph Nat'l Monument
- Proposed open space

Jurisdiction

- Corrales
- Los Ranchos
- Rio Rancho

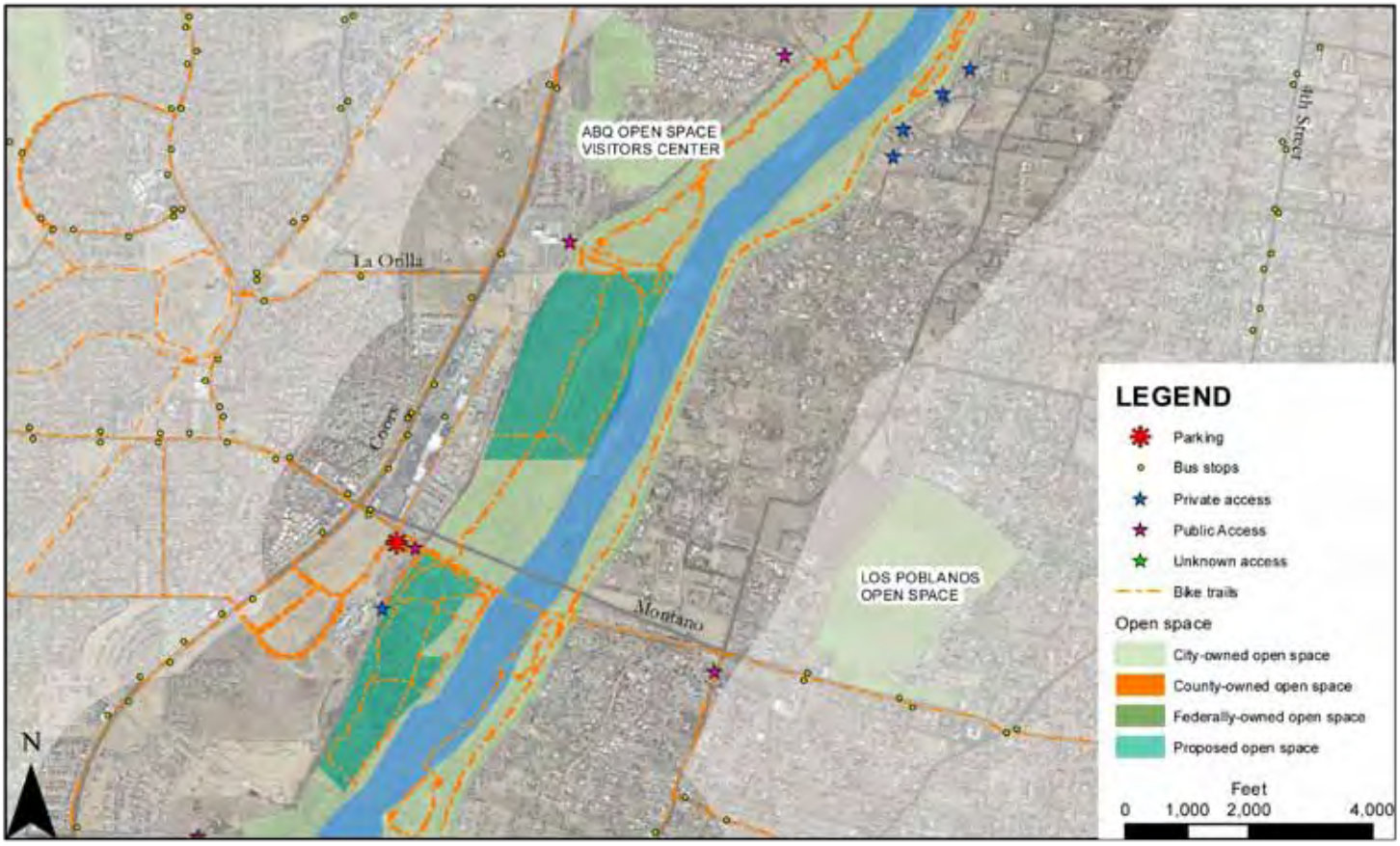
Miles
0 1.25 2.5 5

GIS composite map enlargements at crossings



Alameda and Paseo del Norte Crossings

NW and SE crossing areas are very busy. The SE crossing in particular is completely full on many weekends. Paddlers come out of the river in the NW area in order to avoid the diversion dam. Portage is possible on the west side of the dam, but this has not been formalized. The diversion dam facilities, a well head and a restoration area obstruct access to the river from the SE area, but the parking area is convenient and sizable, so it is heavily used. Circulation via car along Alameda or between access areas is difficult. Interview information suggests that there is some equestrian activity along western trails including circulation under the west side of the bridge. This area can be muddy at times.



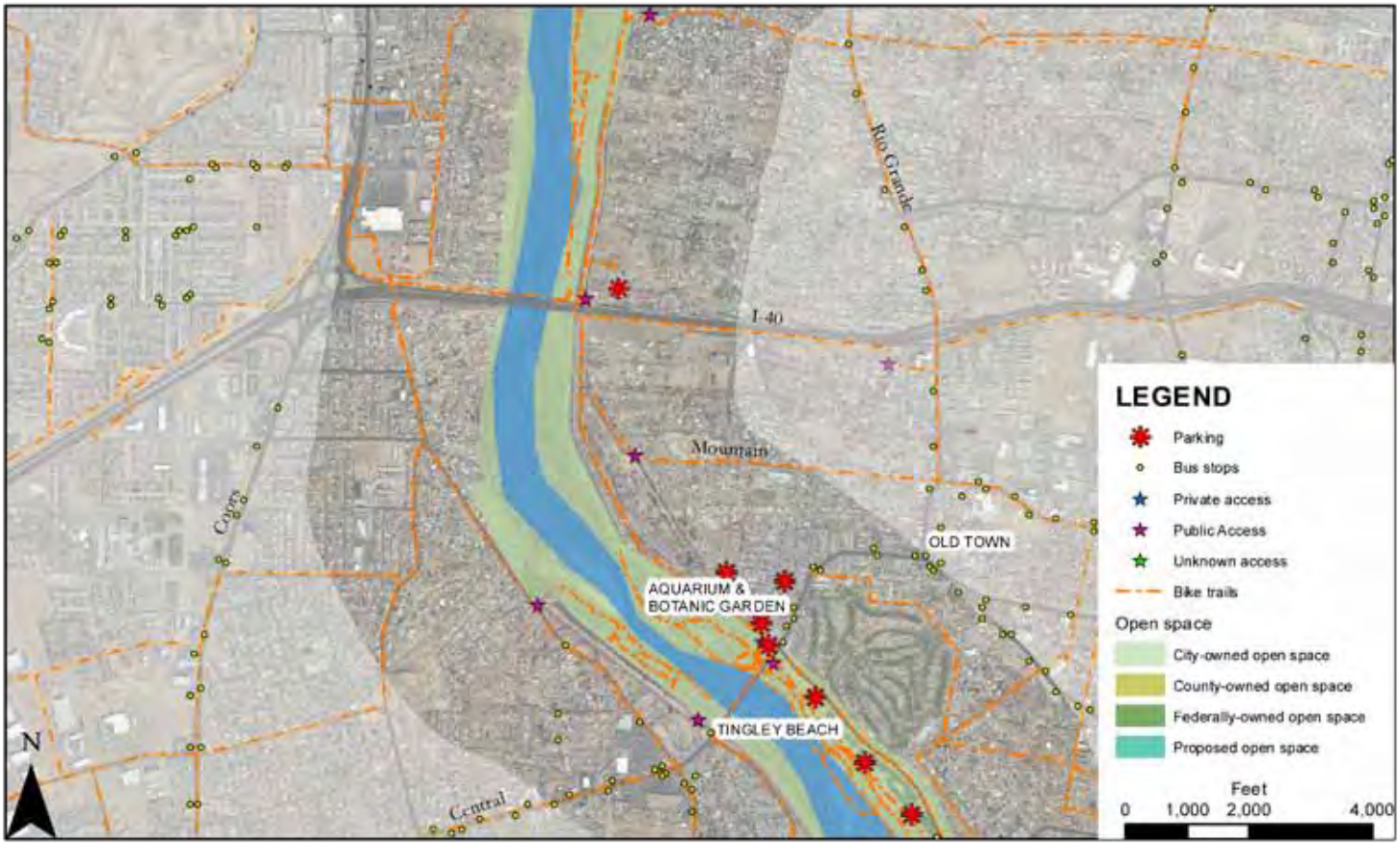
Montaño Crossing and Albuquerque Open Space Visitor's Center

La Orilla is an under utilized and convenient west side access point. The Open Space Visitor's Center cannot direct visitors through the fields to the river, due to an agreement put in place during development of the facility. This needs to be reconsidered in order to make optimal use of this facility. Parking on the SW side of the bridge is limited, but the trail facilities are well developed. Parking on the east side of the river at Montaño is far away and disconnected from the river.

GIS composite map enlargements at crossings

Montaño Crossing, Rio Grande Nature Center State Park and Los Poblanos Open Space

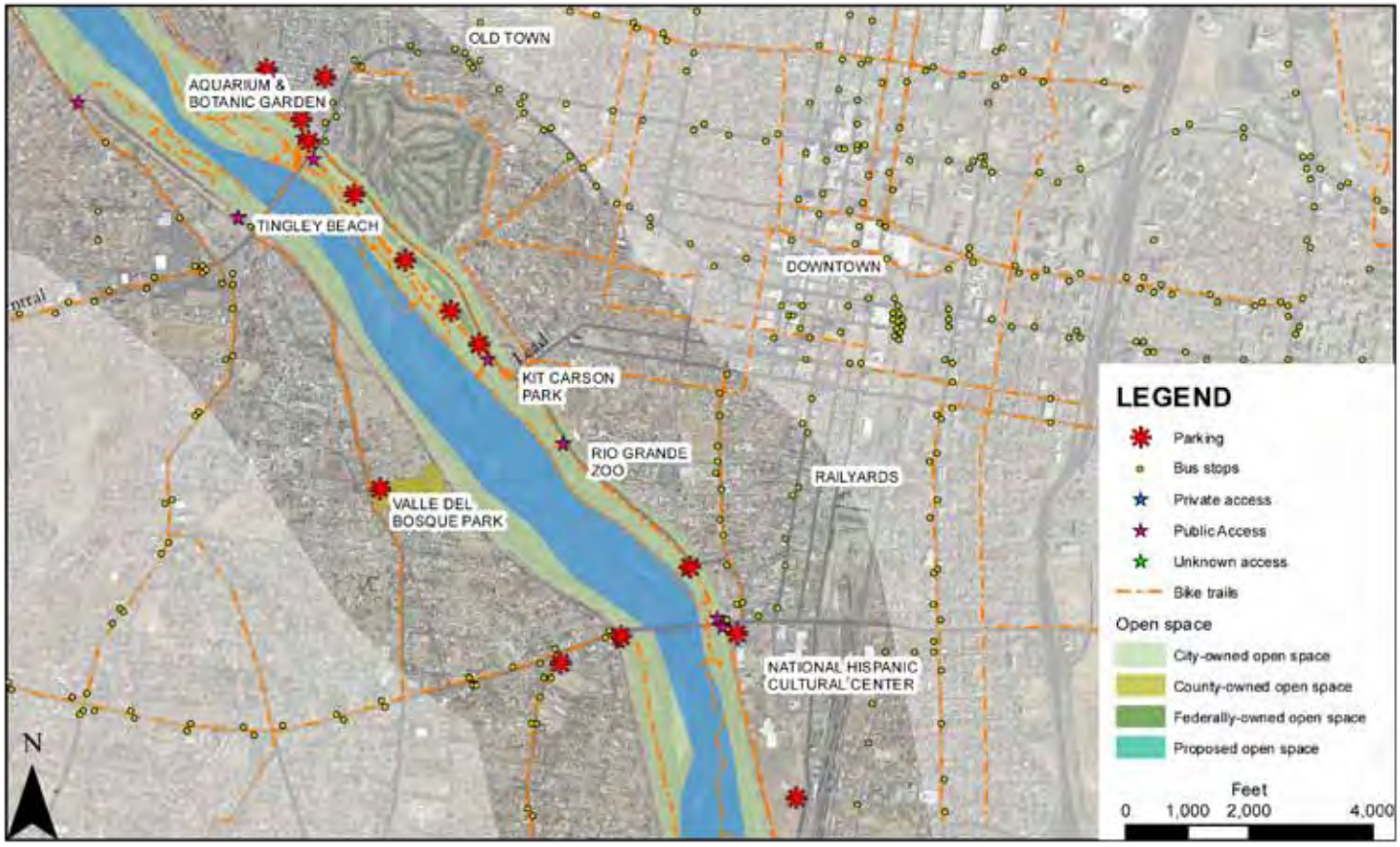
The Oxbow area on the west side is a unique ecological area that is relatively inaccessible but can be viewed from above. The Rio Grande Nature Center is a center of activity in this area of the river corridor – with educational facilities, interpretive trails, parking and the only rest rooms in the northern stretch of the Paseo del Bosque trail. r.



I-40 and Central Crossings, Old Town and Bio Park: Aquarium, Botanic Garden and Tingley Beach

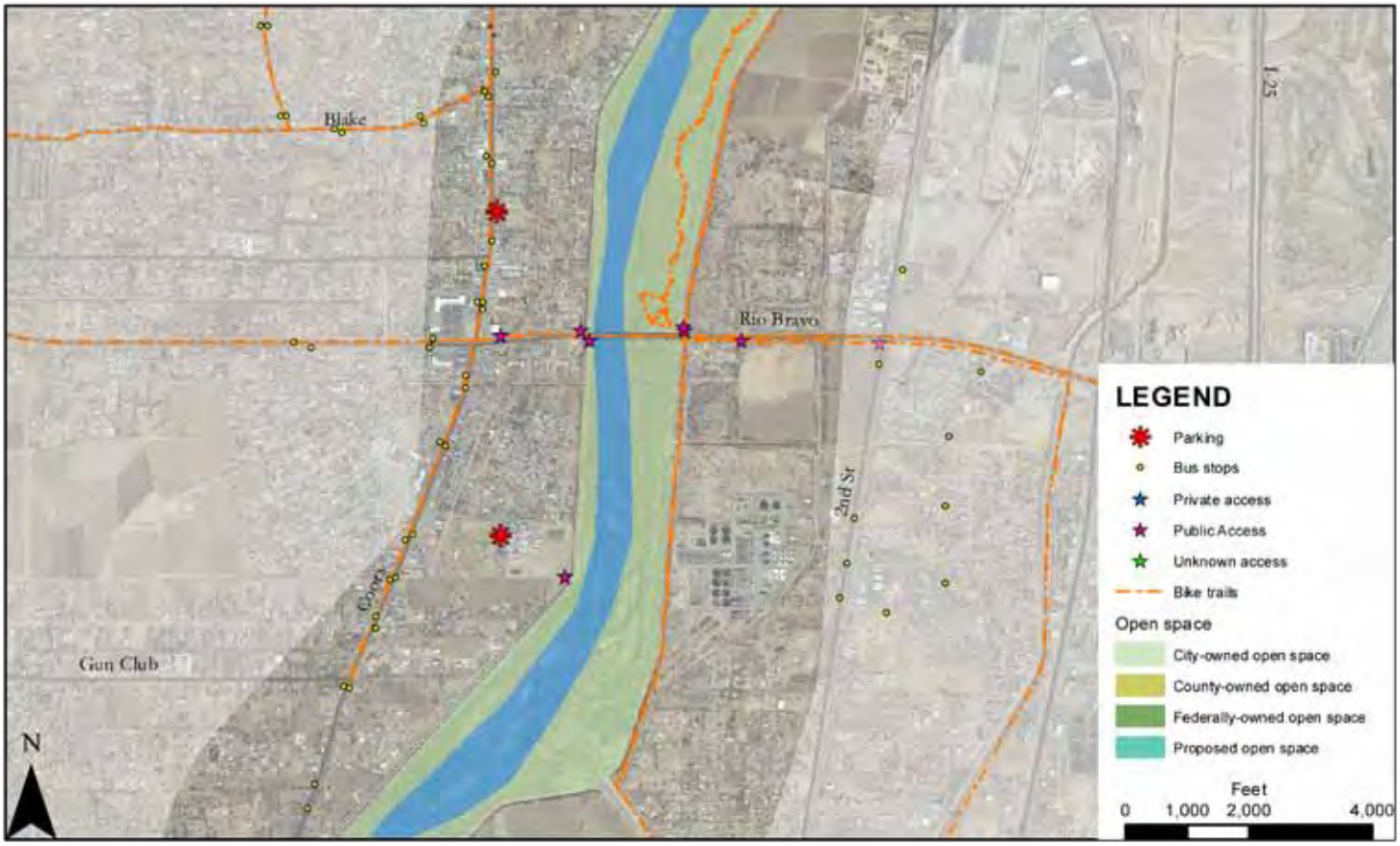
According to recent preliminary trail counts, the intersection of the Paseo del Bosque and the I-40 trail has the highest daily counts of any trail area in the City. A parking lot located in the NE area is infrequently used. Mountain Road provides a direct connection between Old Town and the north area of the ABQ BioPark. There is a small park there and a circuitous connection to the Paseo del Bosque. This could be much more. The east side of Central Avenue at the bridge crossing is the most active location of the corridor and includes ABQ Bio-Park facilities, the Paseo del Bosque and restoration areas with soft surface trails, ponds and bridges. On the west side, the north area has potential for more recreation use, and the area is included in COE restoration plans. The SW area is used frequently for parking including parking on the levees, and this needs to be addressed in the plan.

GIS composite map enlargements at crossings



Central Avenue and Bridge Boulevard Crossings, and National Hispanic Cultural Center, Old Town, Downtown, and the Bio Park: Aquarium, Botanic Garden, Tingley Beach, and the Rio Grande Zoo.

The close proximity of many recreation and tourist destination on the east side of the river are evident on this map. There is potential for linking the ABQ BioPark facilities, the river and the National Hispanic Cultural Center in a way that creates a new recreation or tourist amenity in the area. A “Cultural Loop” or similar trail/connection concept could also include Old Town and Downtown. On the west side, a new overlook and connection to the river at the Valle del Bosque Park is considered by many land managers and stakeholders to be a good example of improved connectivity to the Rio Grande. Note that the west side of the Bridge Boulevard Crossing is Bernalillo County property.



Rio Bravo Crossing

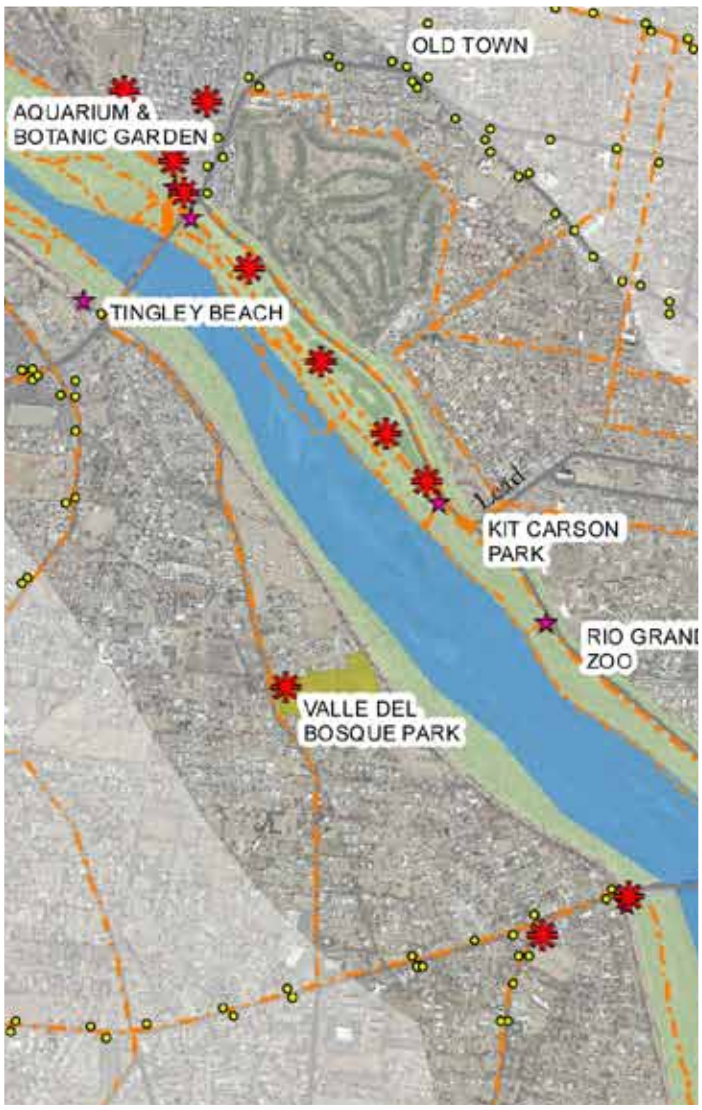
The NW area near the bridge is a popular spot for paddlers, but there is not much room or easy access. Farther south, the South Diversion Channel area, the new Valle del Oro National Wildlife Refuge and the Durand Open Space Area all represent opportunities for improved access to the river. All of these properties are outside of the City of Albuquerque.

connectivity

Multi-modal connectivity to the River is an important aspect of making access more convenient and giving people a variety of ways to experience the river. The 16 mile Paseo del Bosque trail provides strong connectivity along the east side of the river, from Alameda to Rio Bravo. There is no comparable facility on the west side of the river, but there is an extensive system of soft surface trails that facilitate some north-south movement and connect portions of the western edge back to the adjacent neighborhoods.

As the mapping of the corridor evolves, existing physical connections to the river corridor will continue to be confirmed and connections to existing trails, bikeways and bus routes will be documented.

We will also continue to gather information on site specific amenities (parking, restrooms, litter receptacles, picnic areas, water, etc) at river crossings and river/bosque entry areas in order to better understand the support amenities that might be needed along the corridor.




Montaño Boulevard


Central Avenue

river crossings

River Crossing	Jurisdiction	Access and Development Review Policy
I-25	NMDOT	NMDOT Access Control
Rio Bravo Boulevard (NM 500)	NMDOT	MRGCD Access Control County Development Review
Bridge Boulevard (NM 314)	City East of River Bernalillo County West	City or County Development Review
Central Avenue	City of Albuquerque	City Development Review
I-40	NMDOT	NMDOT Access Control
Montano Road	City of Albuquerque	MRGCD Access Control City or Village Development Review
Paseo del Norte (NM 423)	NMDOT	NMDOT Access Control MRGCD Access Control
Alameda Boulevard (NM 528)	NMDOT	City and NMDOT Development Review
US 550	NMDOT	Town and NMDOT Development Review

Since the beginning of this project, there has been discussion of the crossings – that these are the locations that are most appropriate for new projects that will Connect and Protect. There are nine (9) crossings over the Rio Grande River in the Albuquerque metro area, from the Isleta Indian Pueblo to Bernalillo. City of Albuquerque, NMDOT, and Bernalillo County staff were contacted to determine the jurisdictions with access approval at the existing river crossings. The table above summarizes jurisdiction at the crossings.

The river crossings at I-25, I-40 and Paseo del Norte are access controlled facilities, and therefore the NMDOT will not allow access from those facilities. In addition, the west legs of Rio Bravo Boulevard and Bridge Boulevard are under the jurisdiction of Bernalillo County. Portions of the east leg of Montaño Road is under the jurisdiction of Los Ranchos de Albuquerque, and both approaches to the US 550 crossing (out of our project area, but a popular put in for paddlers) are under the jurisdiction of the Town of Bernalillo. These jurisdictions would need to be considered in any access requests to the roadways.

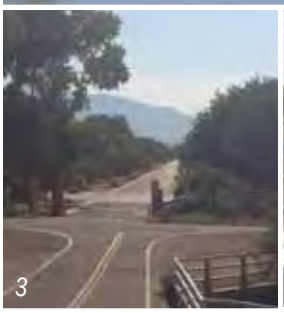
Based on discussions with the agencies, and our knowledge of the access control and review policy, the river crossings with the highest likelihood of approval for an additional or expanded access would be: Bridge Boulevard, Central Avenue, and Alameda Boulevard. Requests for new driveways or intersections for these roadways would be initiated through the development review process for each jurisdiction.

site photos/ idea photos

As part of the research portion of the project, we have captured images of certain areas of the river corridor. We will continue to build an image portfolio of existing conditions during the project and use this as a reference during discussion of potential improvements in, adjacent to and overlooking the river.

On the opposite page are “idea pictures” which we used to stimulate discussion and feedback during the recent public meetings that were held on October 2nd at the Albuquerque Museum, and October 3rd at the Open Space Visitor’s Center. This group of pictures is not meant to be an inventory of potential projects/amenities/improvements being considered for the corridor. We envision that this group of idea pictures will expand and contract as the team and committees consider options for new amenities and focus on the locations for these improvements.

1. *Rest area at Campbell Road and Paseo del Bosque*
2. *View south of Central bridge*
3. *Campbell Road*
4. *Central Ave. bridge*



idea photos













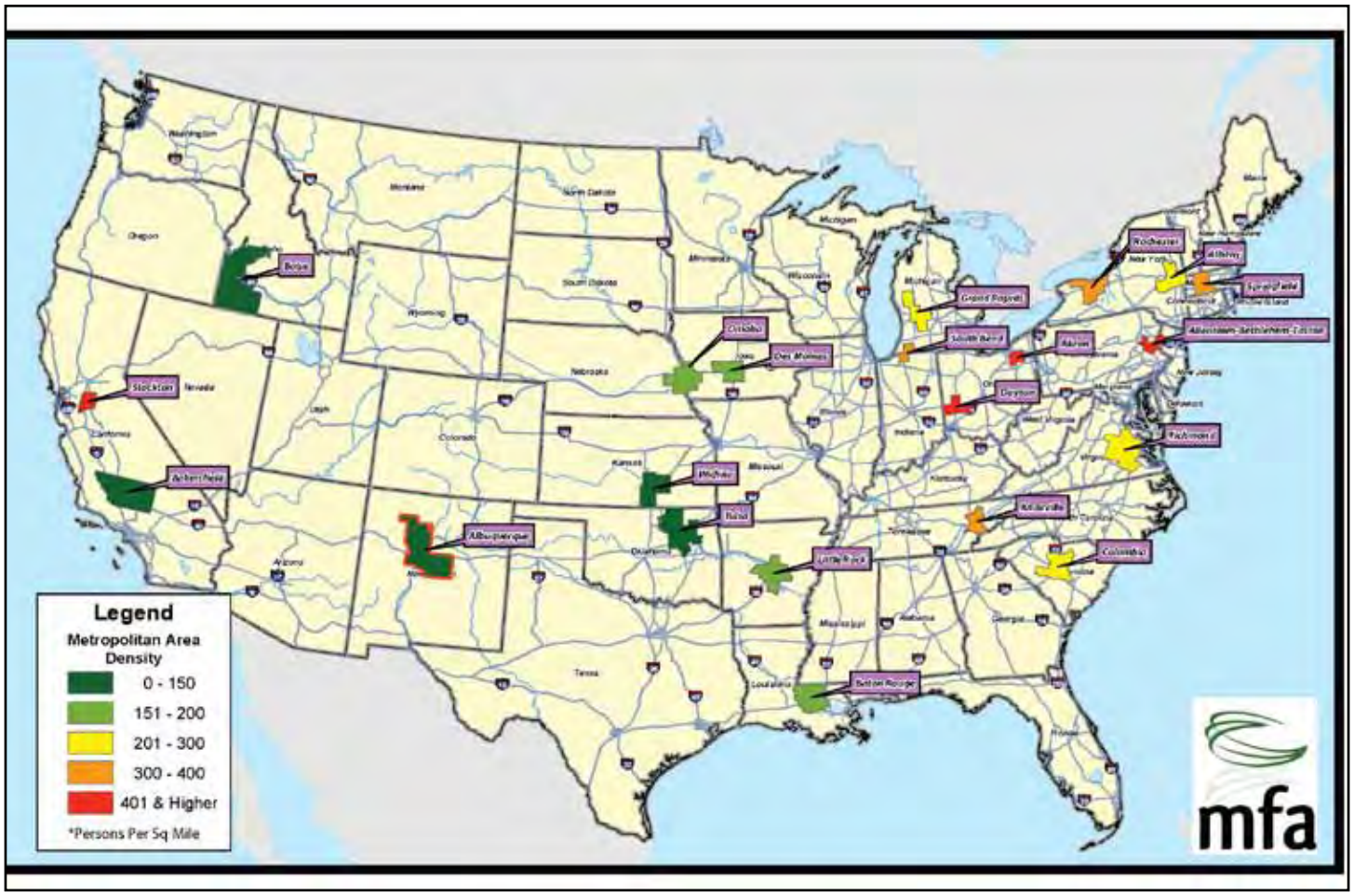






comparable cities

As part of our research, we have identified US river cities with metropolitan area populations similar to Albuquerque. This is a bit different than the precedent research found later in the report. This data allows comparisons among like sized river cities and helps focus ongoing research related to trends in recreation, organizational/operational structures, and funding for improvements. Additionally, we are interested in seeing how these cities promote and market their rivers.



Similarly Sized River Cities to Albuquerque

MSA	State	Metro Population	River in Downtown	River Name	Park land along River	Region of Country
			Yes/No		Yes/No	
Albuquerque	**NM**	**898,258**	**Yes**	**Rio Grande**		
Des Moines	IA	578,175	Yes	Des Moines	Yes	West North Central
Springfield	MA	693,601	Yes	Connecticut	Yes	New England
Wichita	KS	628,087	Yes	Arkansas	Yes	West North Central
Stockton	CA	686,655	Yes	San Joaquin	Yes	Pacific
Akron	OH	703,315	Yes	Little Cuyahoga	Yes	East North Central
Knoxville	TN	704,510	Yes	Tennesse	Yes	East South Central
Little Rock	AK	708,545	Yes	Arkansas	Yes	West South Central
Columbia	SC	778,046	Yes	Congaree	Yes	South Atlantic
Grand Rapids	MI	777,839	Yes	Grand	Yes	East North Central
Baton Rouge	LA	811,434	Yes	Mississippi	Yes	West South Central
Allentown Bethlehem Easton	PA	824,358	Yes	Lehigh and Deleware	Yes	Mid-Atlantic
Dayton	OH	840,338	Yes	The Great Miami	Yes	East North Central
Bakersfield	CA	847,032	Yes	Kern	Yes	Pacific
Albany	NY	873,553	Yes	Hudson	Yes	Mid-Atlantic
Omaha	NE	873,472	Yes	Missouri	Yes	West North Central
Tulsa	OK	943,415	Yes	Arkansas	Yes	West South Central
Rochester	NY	1,054,141	Yes	Genesee	Yes	Mid-Atlantic
South Bend	IN	319,303	Yes	St. Joseph	Yes	East North Central
Richmond	VA	1,270,720	Yes	James	Yes	South Atlantic
Boise	ID	625,585	Yes	Boise	Yes	Mountain

Sources: MFA, ESRI

recreation participation rates

Recreation participation and potential participation data is based on regional recreation data and community demographic attributes including age. Albuquerque's great weather, extensive park system, open space, and trails contribute to participation rates. This activity specific data may help prioritize new projects along the river corridor. The figures below represent a projection of the number of times residents of the Albuquerque metro area may engage in a number of key activities that may take place along the river based on New Mexico's participation rates. This does not include visitors (tourists) to the ABQ area. At this time we don't have a way to estimate the "capture rate" for a developed river corridor but it is most likely that people living or working close to the river corridor are the most likely to engage in these activities along the corridor.

It is important to note that the numbers of participants and experiences for activities that require a venue may be depressed in New Mexico. For example, if there are no ice rinks, the survey results upon which this data is based would suggest that the number of ice skaters would be low. There are several activities on this list, such as swimming and kayaking that might post higher participation and experience numbers if there were more places to swim or kayak near population centers.

With that in mind, there are a several ways to interpret these results. The first is to choose the relative importance of supporting activities with more individuals or ones with more experiences. Another interpretation issue is to focus on activities that can be distinctly engaged in on the river and not many other places – like swimming, fishing, and kayaking, or those that can occur on any trail system like the leading trail uses by number of experience - like exercise walking, running, and bicycle riding. As noted already, another question is whether any of these activities is already adequately supported in Albuquerque with "supply" like trails and pools or waterways for fishing and kayaking.

Our preliminary conclusion is that virtually no metro are in the US has been adequately supplied by trail systems, swimming facilities, mountain biking trails, or paved trails for in-line skating. Many metro areas have made the leap to embracing their rivers- providing access to their rivers and adequately supplying fishing and kayaking access. Albuquerque has not. Therefore we leave you with this table and the recognition that while the water activities of swimming, fishing, and kayaking, excepting swimming, are far lower in the numbers than the other activities, they can only happen on waterways – and it's really difficult to access Albuquerque's at this time. That said, the numbers posted by the trail using activities are so overwhelming that the market supply (or capacity if you prefer) for a new riverside trail would almost immediately be absorbed if offered.

All of these activities would be popular with visitors (tourists) and would be most well received by visitors if provided near the Bio-Park as it is already the city's most popular non-casino attraction and the visitors are already nearby.

Albuquerque riverside drain near the Rio Grande Nature Center

The figures below represent a projection of the number of times residents of the Albuquerque metro area may engage in a number of key activities that may take place along the river based on New Mexico's participation rates. This does not include visitors (tourists) to the ABQ area. At this time we don't have a way to estimate the "capture rate" for a developed river corridor but it is most likely that people living or working close to the river corridor are the most likely to engage in these activities along the corridor.

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Paseo del Bosque parking area on the east side of the Central Bridge

Table 1. Participation Potential, Frequency and Annual Participation Days, Albuquerque MSA, NM

Participation	Frequent		Occasional		Infrequent		Total			Annual Participation			
										Median Days	Average Days		
	2011	2016	2011	2016	2011	2016	2011	2016	Change			Total 2011	Total 2016
Bicycle Riding	0	0	52,618	56,466	68,235	73,225	120,853	129,692	8,839	20	28.34	3,424,966	3,675,459
Exercise Walking	36,581	39,256	143,557	154,057	127,265	136,573	307,404	329,886	22,483	25	53.45	16,430,722	17,632,421
Freshwater Fishing	98,167	105,347	0	0	30,324	32,542	128,491	137,889	9,398	20	18.08	2,323,125	2,493,033
Hiking	0	0	93,457	100,292	86,268	92,578	179,725	192,870	13,145	5	6.88	1,236,511	1,326,946
Swimming	0	0	59,021	63,338	77,602	83,278	136,624	146,616	9,992	20	33.75	4,611,054	4,948,294
Running/Jogging	18,054	19,374	67,922	72,889	11,613	12,462	97,588	104,726	7,137	100	99.52	9,712,002	10,422,312
In-Line Roller Skating	8,271	8,876	12,516	13,431	15,809	16,966	36,596	39,272	2,677	5	5.00	182,978	196,361
Kayaking	5,095	5,468	7,486	8,033	15,911	17,075	28,492	30,576	2,084	2	13.59	387,203	415,522
Mountain Biking Off Road	10,949	11,750	41,785	44,841	27,696	29,721	80,430	86,312	5,882	10	14.89	1,197,602	1,285,191
Bicycle Riding	0	0	52,618	56,466	68,235	73,225	120,853	129,692	8,839	20	28.34	3,424,966	3,675,459

Source: ESRI Business Analyst, NSGA, MFA

river cities - "wild" as a differentiator for albuquerque

Aerial images help contribute to our knowledge of the physical land use and development patterns along the rivers in other similarly sized river cities. For example, Albuquerque's river edges are generally considered "wild" – with meandering channels, edges and banks carved by the water, islands covered in willows, and wide areas of cottonwood bosque on the higher banks. The wild character is a differentiator and can provide memorable nature experiences for visitors in the middle of the City. However wild conditions also present challenges for visual and physical access, safety and public perception. We are interested in finding other cities that might have "wild"edges and sections of river, and in seeing how they have integrated these preserve-type areas into their community plans.

albuquerque

Boise, Idaho

Austin, Texas

Richmond, Virginia

Omaha, Nebraska

Columbia, SC

Knoxville, TN

rivers, restaurants, bikes and boats

There are many US cities at or near the size of Albuquerque with rivers passing through or near their downtown area. The great majority of these cities promote access to their river and the river's edge. Almost all have parkland along the river. Many offer some form of bike and/or boat rental at or close to the river when there is a river's edge path. The rental agencies work best when they have both visibility to passersby in cars "the billboard effect" and are on the actual river side path or trail. Sometimes land and buildings - for the operations – with that criterion is in public hands, sometimes it's in private hands. Nearby parking is also a consideration and is a capacity constraint. The renters need to park their cars nearby in a safe lot with three to four hour parking. Length of stay for parking is connected to how long the biking or boating experience there will be. Shorter trails mean shorter stays. The best situations are where the lot can be seen from the rental facility.

Boat rental differs from bike rental in that people often boat one way and need to be picked up downstream – or alternately – they are brought upstream with the boats and float/paddle to the rental facility. This requires space on the rental site for a trailer with a truck to pull up to the rental facility. Boat rental generally prefers on-site boat storage but it can work if that storage is a short walk away.

Many of these river cities also have restaurants with river views. In some communities there are three or four restaurants with water views. Generally the restaurants are on private property but in some cases they have a land lease from a government agency. Since the "river view" itself is the principal amenity, immediate adjacency to the waters edge is not needed but good visibility is a requirement. The location needs to be a few paces from a river edge path or trail. The more active a riverfront, the more restaurants are typically drawn to locate there.

When restaurants are on leased land the length of the lease can be a factor in how upscale the restaurant is. A renter with a long term lease of thirty or more years is likely to invest in a more substantial facility with a more complex kitchen and better furnishings than a renter with a shorter term lease. The type of food served can often be a factor here too. Restaurants with longer term leases can be higher per cap establishments like steak houses and seafood restaurants. Shorter term leases typically result in Mexican or Italian food or burger restaurants with lower per cap expenditures. The best situation would be a mix of casual and upscale dining. The casual would cater to those who are active on the river (boating, biking, hiking) and the upscale would cater to people who just want to come and enjoy the river view and others having a good time as well as business meals and event dinners.

Like the boat and bike rental operations, restaurants need parking and crave visibility. They also require truck access for goods and service. Their uniqueness against all of the other restaurants in town is their location on the river. A location where they can be seen "on the river" by drivers passing by on a boulevard or a bridge is very helpful. Proximity to hotels and other visitor flows like the ABQ BioPark is also supportive.

With the right sites, the project team is confident that the Rio Grande in Albuquerque could support restaurants. We are also confident that it could support a boat rental service and a bike rental with the right sites and a good trail (for bikes).

In an ideal world, this amenity development would occur in the river crossing by the ABQ BioPark (not to the exclusion of another site too). A brand like "Rio Grande Crossing" for the activity node could add to the energy that the adjacent Bio Park has already successfully created.

river related public outreach

River related public outreach predates this project and will continue into the future. Outreach has taken the form of education, public service, recreation and solicitation of public input and opinion via surveys and meetings. Many different groups initiate and support these activities, but two of the most established and consistent are the City of Albuquerque and Rio Grande Nature Center State Park.

The City of Albuquerque routinely offers public education programs, exhibits at the Visitor's Center and ABQ BioPark, and open space volunteering opportunities. Newsletters, an informative web site and partnerships with various organizations such as the Open Space Alliance and the Rio Grande Community Farm cast a wide net and serve to educate a diverse cross section of the community about the Rio Grande.

The 270-acre Rio Grande Nature Center State Park (RGNCSP) could be called the "River Educator" in Albuquerque. Over 130,000 adults and students visit the facility annually to learn about the bosque, the Rio Grande, the habitat, and wildlife found in the area. The facility is directly connected to the Paseo del Bosque multi-use trail, and hosts regular nature and birding tours, presentations, and programs for visitors.

During this project, public outreach occurs through:

- public meetings
- a project website where project information and progress will be shared (www.riograndevision.com)
- an ABQ THE PLAN website that has a public survey
- interview sessions with subject matter experts and stakeholders
- interaction with a steering committee and a technical committee members- volunteers from both the public and private sectors who bring expertise in ecology, recreation, regulation and economic development to the project


Bosque Ecosystem Monitoring Program

Science, Education & Stewardship on the New Mexico Landscape

As the school year ramps up again BEMP gets a whole new set of students out in the bosque for a year of data collection... take a peek at our back-to-school beginnings!

Photos 1 & 2 – After collecting our BEMP data, students from Wilson Middle School's mixed grade Survey of Science class journal along the river. This trip marks the first of about eight that they will take into the bosque throughout the year. Teacher Mary Erwin, has monitored the Rio Grande Nature Center BEMP site with students for the past nine years!

www.rgnc.org

Photo 3 – Fourth & fifth graders from Dolores Gonzales Elementary picnic under the shade of cottonwoods after collecting their BEMP data and visiting the San Juan Chama Drinking Water Diversion Dam just north of their Calabacillas site!

www.aps.edu

Photo 4 – School of Dreams Academy (SODA) teacher Bonnie Dodge and her mixed 7-9th grade students easily jump for BEMPin' JOY in the dry riverbed of Los Lunas. During our entomology prep class for their upcoming pitfall trapping session, students easily crossed the riverbed and kept their shoes DRY as riverflow = zero.

OUR MISSION

The mission of the Bosque Ecosystem Monitoring Program (BEMP) is collaborative long-term ecological monitoring of key abiotic and biotic processes and characteristics to promote continued education, understanding and stewardship of the riparian ecosystem to scientists, teachers, students, policy makers and the public.

BEMP

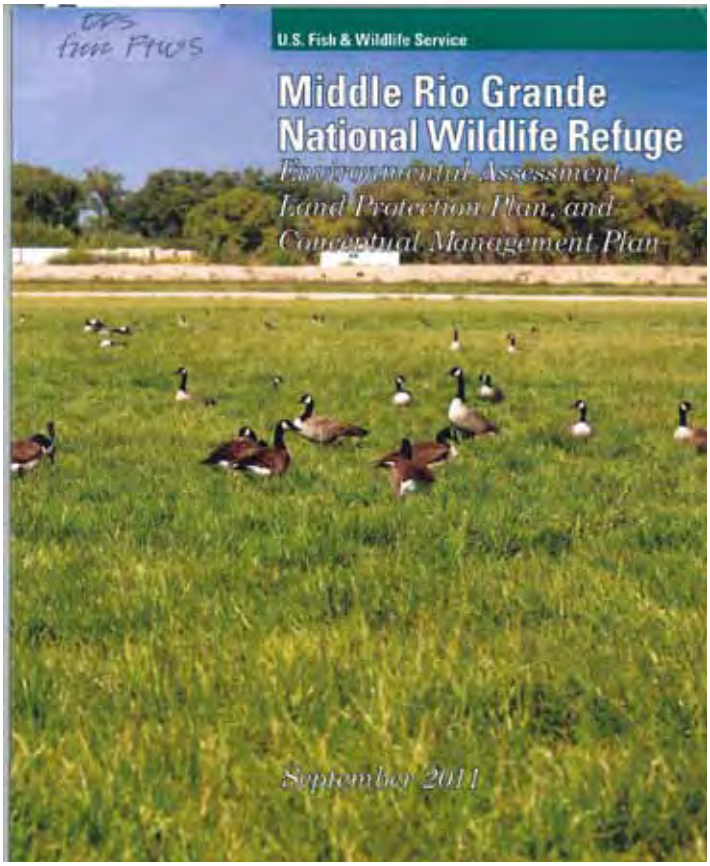
THE UNIVERSITY of NEW MEXICO

BOSQUE SCHOOL

See more about low river levels on pages 2 and 3!

SCHOOL of DREAMS ACADEMY

www.sodacharter.com



ongoing river related programs and organizations

The Rio Grande in Albuquerque has many managers, and these agencies/organizations are described in a subsequent section entitled organizational structure and funding. There are also many on-going river related programs/organizations that have come to our attention and are worth noting.

Middle Rio Grande Endangered Species Collaborative: This group was formed in response to endangered species regulations and its primary mission is to address endangered species issues in a coordinated manner. The majority of river land/water managers are involved in the Middle Rio Grande Endangered Species Collaborative but it is our understanding that this group is not particularly functional. With the upcoming biological opinion on the Rio Grande Project, the composition and mission of this group may change.

Bosque Ecosystem Biological Monitoring Program (BEMP): "The Bosque Ecosystem Monitoring Program is a joint effort coordinated by the University of New Mexico's Long Term Ecological Research network and Bosque School. BEMP research is conducted by student and citizen volunteers along the Middle Rio Grande…" and the bosque. (From the BEMP website) The mission of the established program is to promote continued education and stewardship of the unique riparian ecosystems in the Bosque. BEMP has been collecting data for almost 20 years and now has 27 collection sites in New Mexico.

Friends of the Rio Grande Nature Center: A non-profit organization that supports the mission of the Rio Grande Nature Center State Park. The organization funds programs, manages several research projects, runs the park store, and has over 170 trained naturalists.

Friends of the ABQ BioPark: A non-profit that promotes community interest and development in the BioPark, and raises funds for the BioPark.

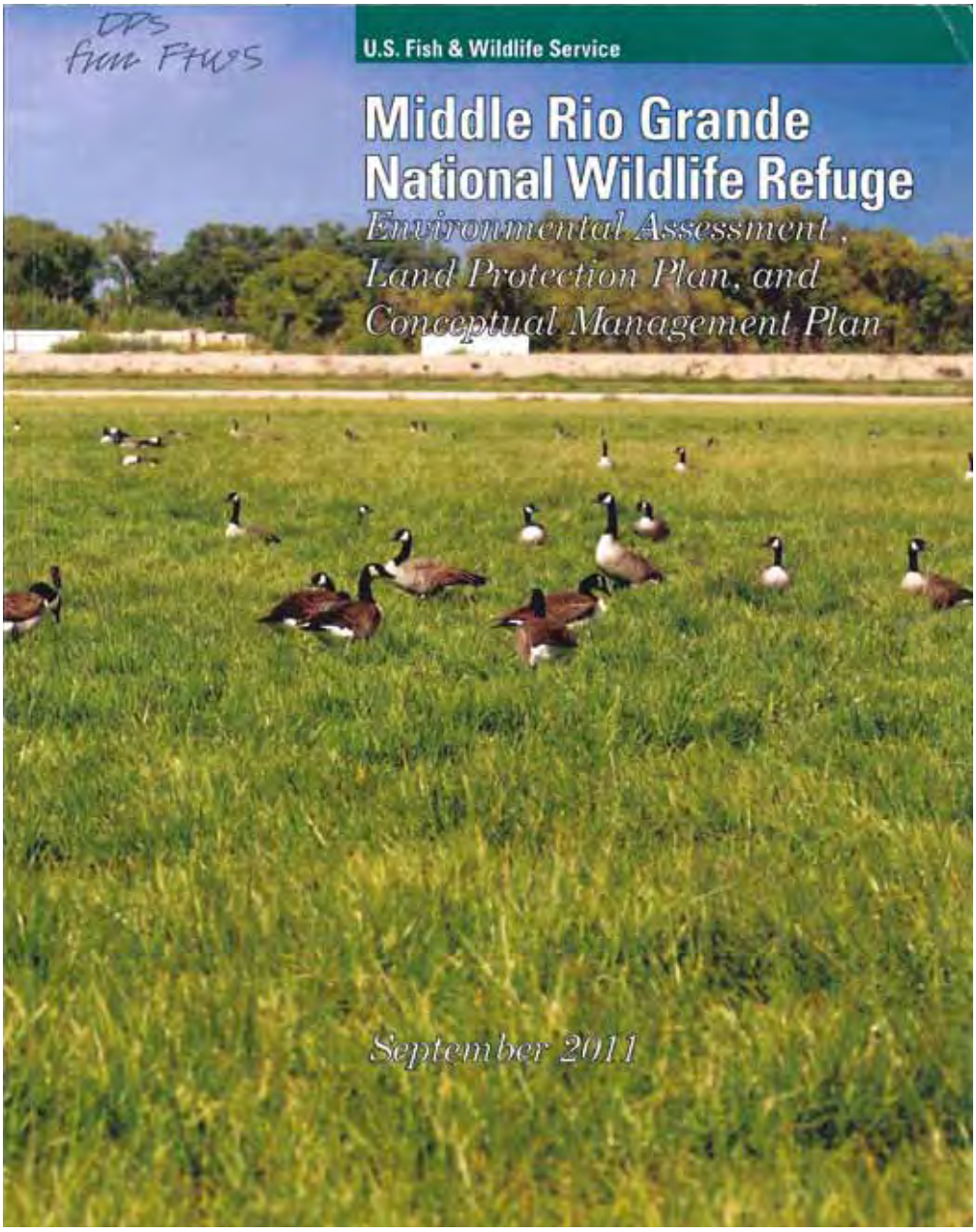
Open Space Alliance: A non-profit that promotes conservation, education and public awareness of public open space areas and provides financial support for these activities.

New Mexico Outdoors Coalition: A new organization comprised of "…a network of public, private, and non-profit organizations and interested individuals who are committed to conservation and outdoor recreation." (from NMOC website)

relevant documents

The next pages include information on relevant documents. Included in this list are scientific studies, regulatory documents and planning documents from the past and present. When considered in total, it is apparent that river managers and stakeholders have been trying to come to terms with the concept of Connect And Protect for a long time. This effort continues today with a wide variety of rules, planning frameworks, restoration efforts and design solutions that reflect each organizations mission within the river corridor.

Two of the most recent efforts are noted here, and others are listed on subsequent pages. Others not included in the page spreads, but noted as important by project steering committee members include : *Water Based Recreation Study,* SW Land Research for the City of Albuquerque, December 1985; *MRGCD Water Policies Pla*n, Sumars, Jofuku, Nunn, Shoemaker, et al, April 1993.

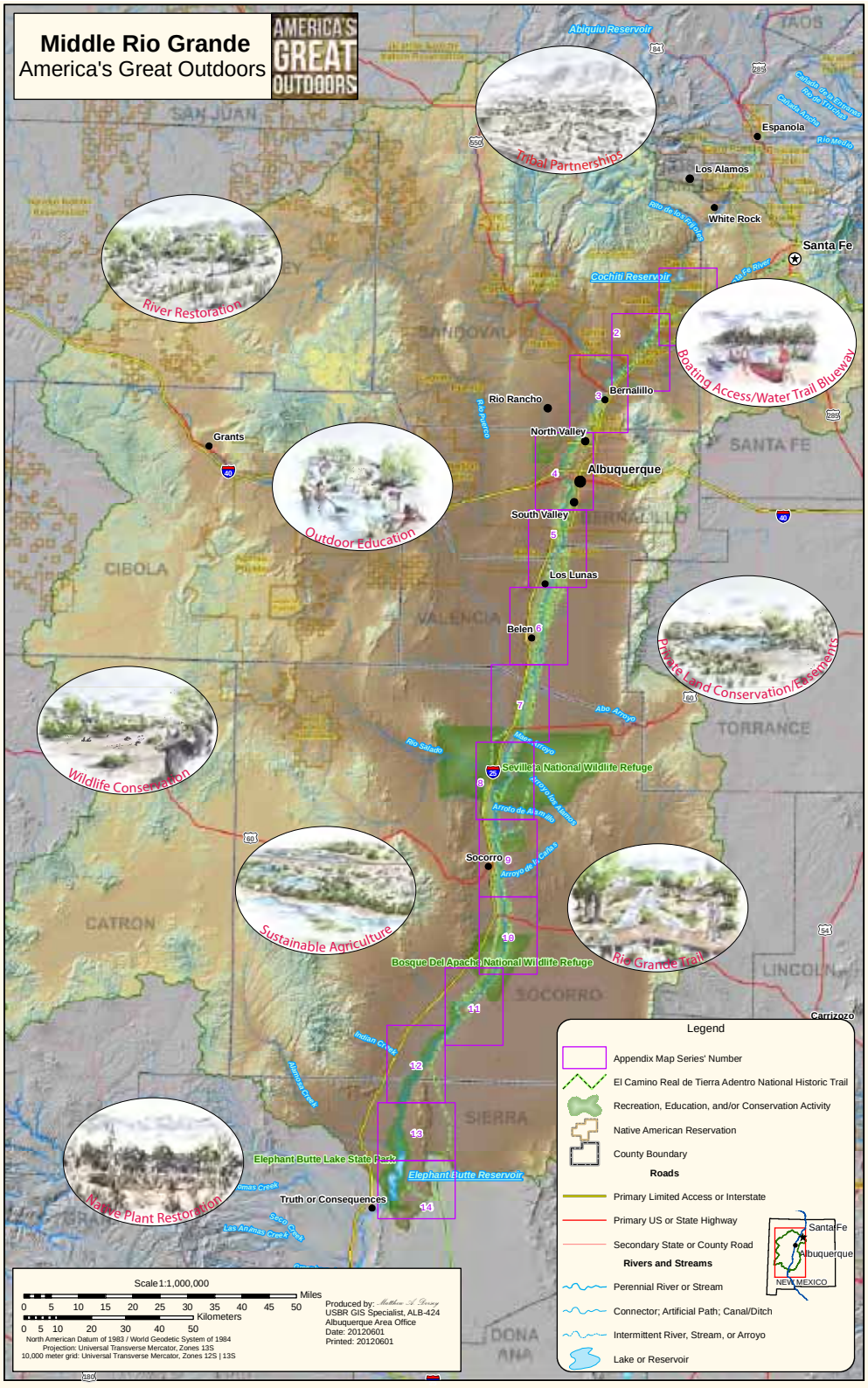


Middle Rio Grande National Wildlife Refuge- Environmental Assessment, Land Protection Plan and Conceptual Management Plan

U.S. Fish and Wildlife Service, Albuquerque, NM, September 2011

Middle Rio Grande Conservation Initiative

United States. U.S. Department of the Interior, Secretary's Committee for the Middle Rio Grande Conservation Initiative: Dave Simon EcoThink and former director of NM State Parks, Kelly Gossett, New Mexico Outdoors Coalition, Amalia Ken Ward, New Mexico Archaeological Council, Derrick Lente, Chairman of the Board Middle Rio Grande Conservancy District, Matthew Schmader, Superintendent, Open Space Division, City of Albuquerque, Oscar Simpson, New Mexico Backcountry Hunters and Anglers, Charles Walter, Executive Director, New Mexico Museum of Natural History and Science. New Mexico, 2012.



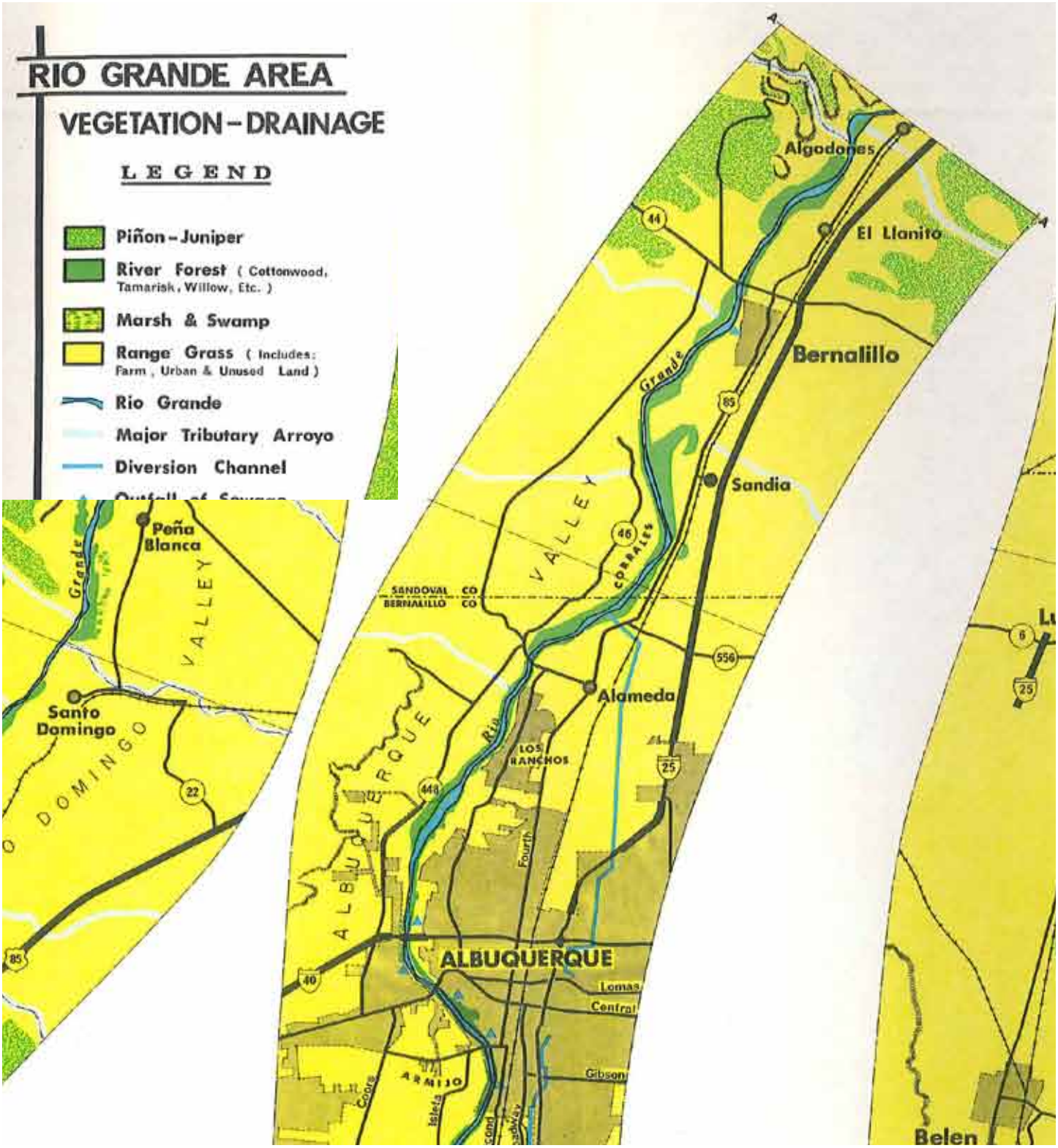
Listed alphabetically by author (corresponding to bibliography)

Major Public Open Space Facility Plan

City of Albuquerque. Albuquerque, NM: 1999.

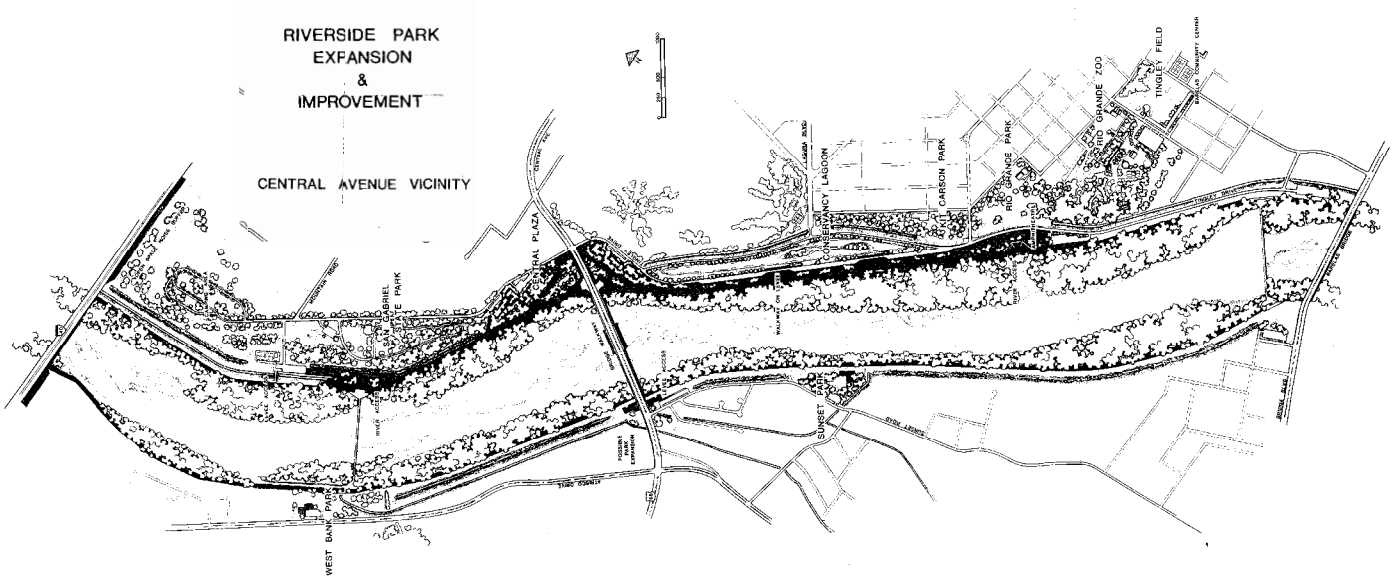
Rio Grande Valley State Park, A Feasibility Study and Preliminary Plan for a Central New Mexico State Park along the Rio Grande.

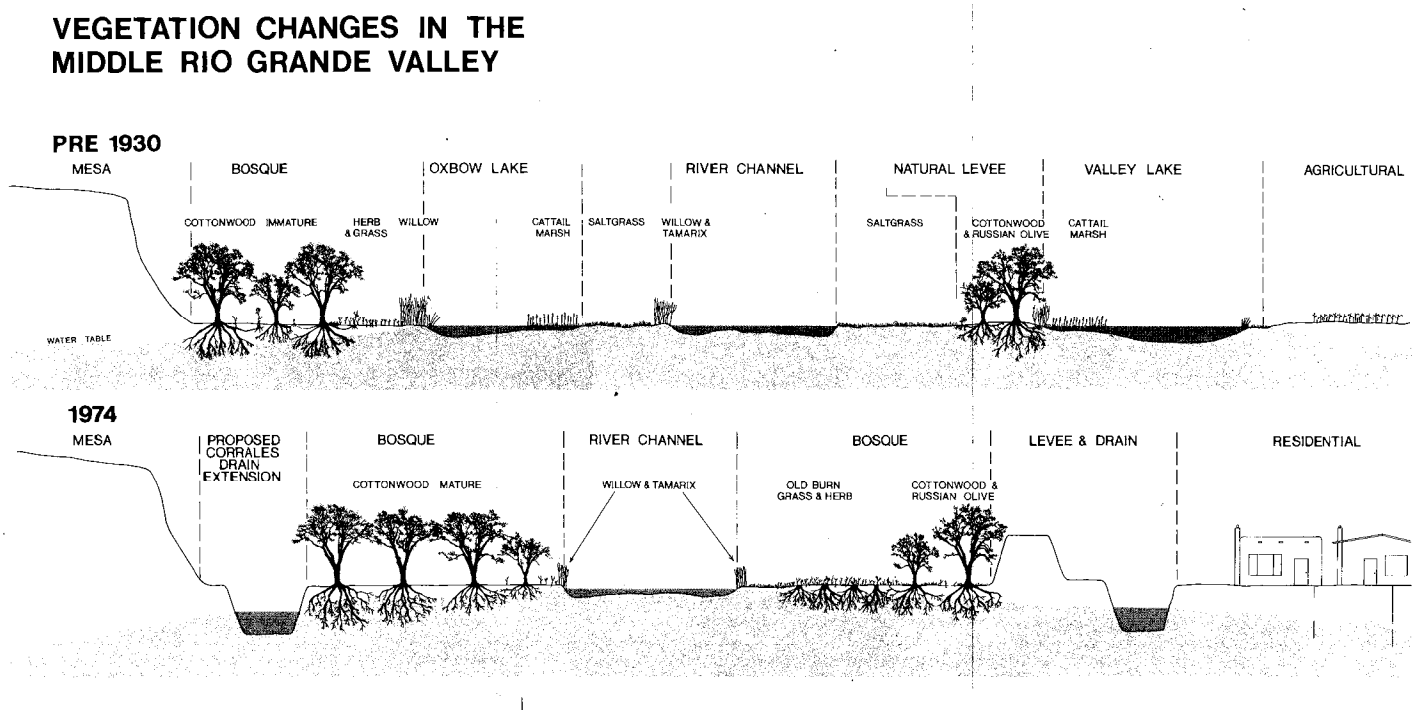
Chambers and Campbell, Inc. for New Mexico State Park and Recreation Commission. Santa Fe, New Mexico: 1969



The Rio Grande in the Albuquerque Metropolis: Plan Recommendations and Data Volume for a “City Edges” Study.

Chambers - Campbell - Isaacson - Chaplin, Inc. for City of Albuquerque. New Mexico: 1975

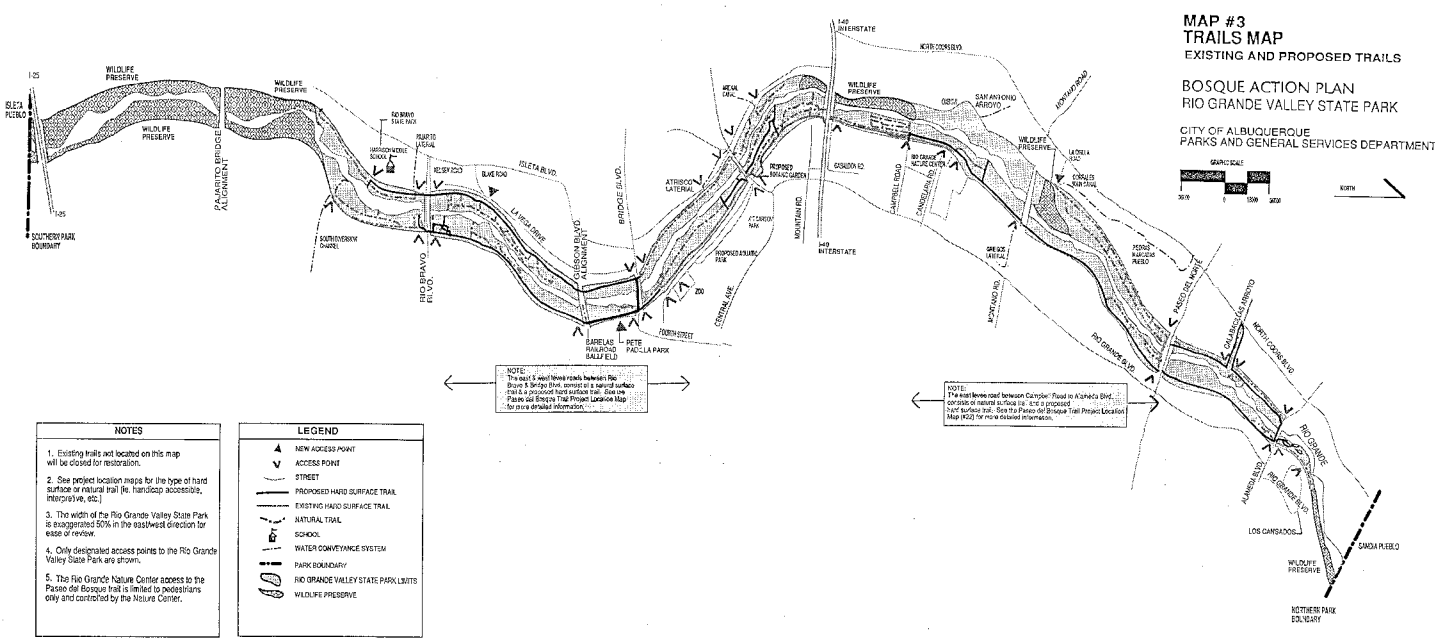




Bosque Action Plan, Rio Grande Valley State Park. Albuquerque. 1993.

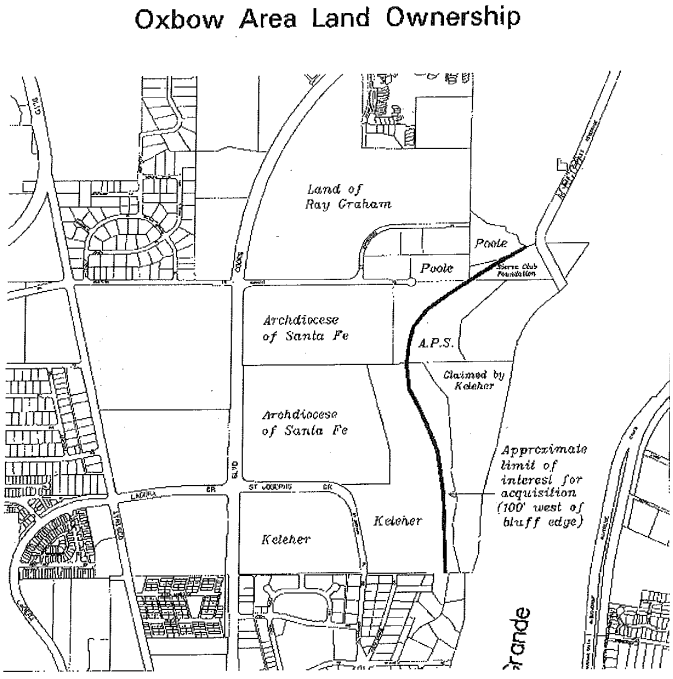
City of Albuquerque. Parks and General Services Department.
Website: *http://www.cabq.gov/planning/publications/documents/BosqueActionPlanParksGeneralServices0193.pdf/view*

Policies emphasize ecological restoration, maintenance, education, and maintaining the natural and cultural characters of the River area while encouraging recreation and other public uses and increasing access in non-sensitive areas. An ecologically compatible, multi-use trail system is identified for development, located, and estimated, as well as a variety of projects.



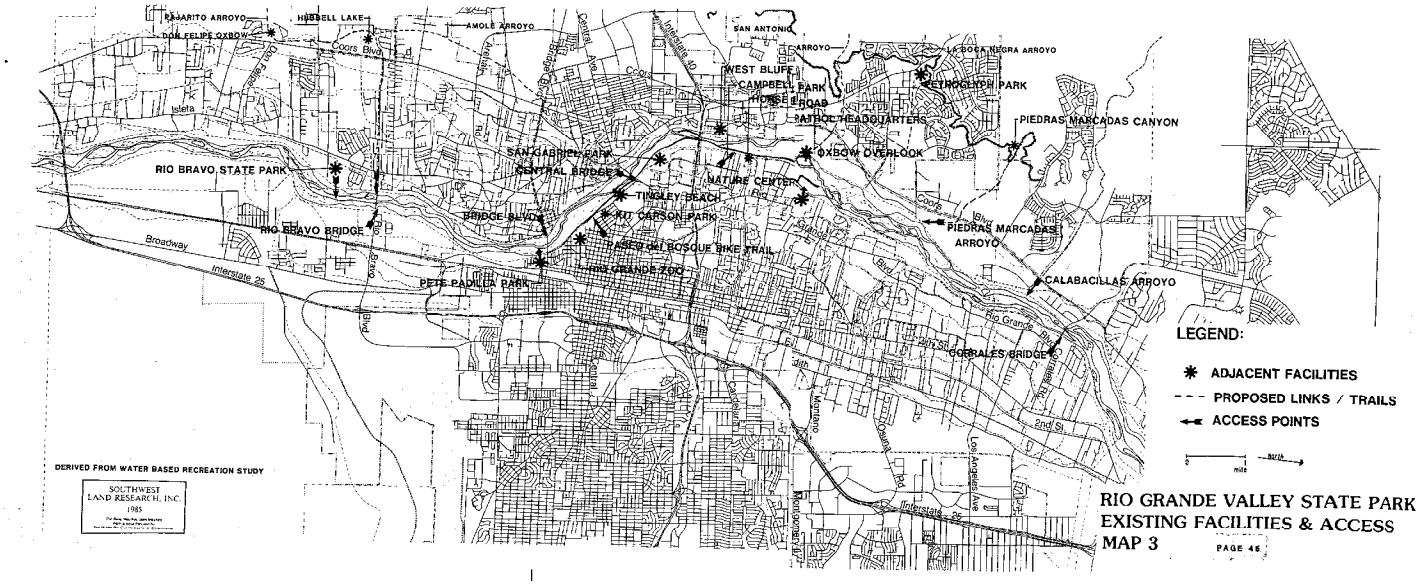
San Antonio Oxbow Biological Management Plan with Inspection & Maintenance Plan for San Antonio Arroyo Out Fall.

City of Albuquerque, Parks and General Services Department,
Open Space Division. Albuquerque, NM: 1997.



Rio Grande Valley State Park Management Plan.

City of Albuquerque, Parks and Recreation, Open Space Division. Albuquerque. 1987.



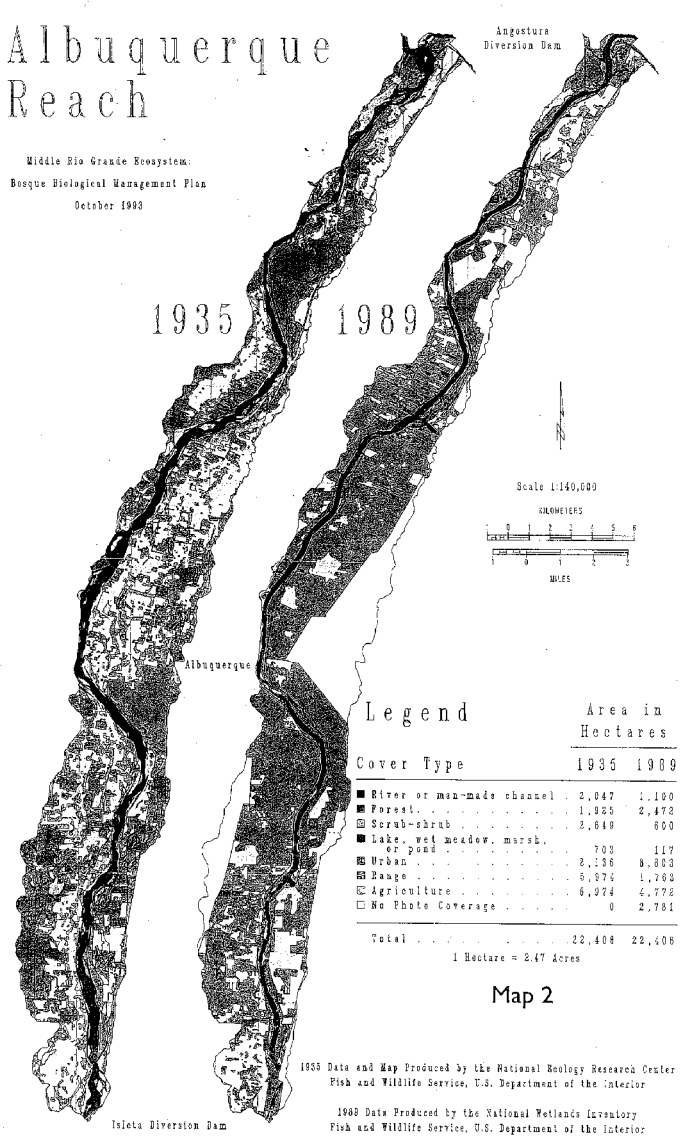
Significant project subsequent to the plan:

Rio Grande Trail (Land and Water Trail)

This project is technically within Rio Grande Valley State Park, which is managed under a trilateral agreement among City Open Space, MRGCD, and NM State Parks. While Director of New Mexico State Parks, Dave gained great familiarity with this area and launched the “Rio Grande Trail” and “Rio Paddle” projects to enhance land and water trail recreation along the river throughout New Mexico (and in the Albuquerque area in particular) and he continues to work on these projects presently.

Middle Rio Grande Ecosystem: Bosque Biological Management Plan.

Middle Rio Grande Biological Interagency Team: Crawford, Clifford S., Anne C. Cully, Rob Leutheuser, Mark S. Sifuentes, Larry H. White, and James P. Wilber, and Technical Coordinator Rayann E. Robino. Middle Rio Grande Biological Interagency Team: Clifford S. Crawford, University of New Mexico, Team Leader, Anne C. Cully, U.S. Fish and Wildlife Service, Rob Leutheuser, U.S. Bureau of Reclamation, .Mark S. Sifuentes, U.S. Army Corps of Engineers, and Adjunct Team Member: James E. Knight. Albuquerque, 1993.

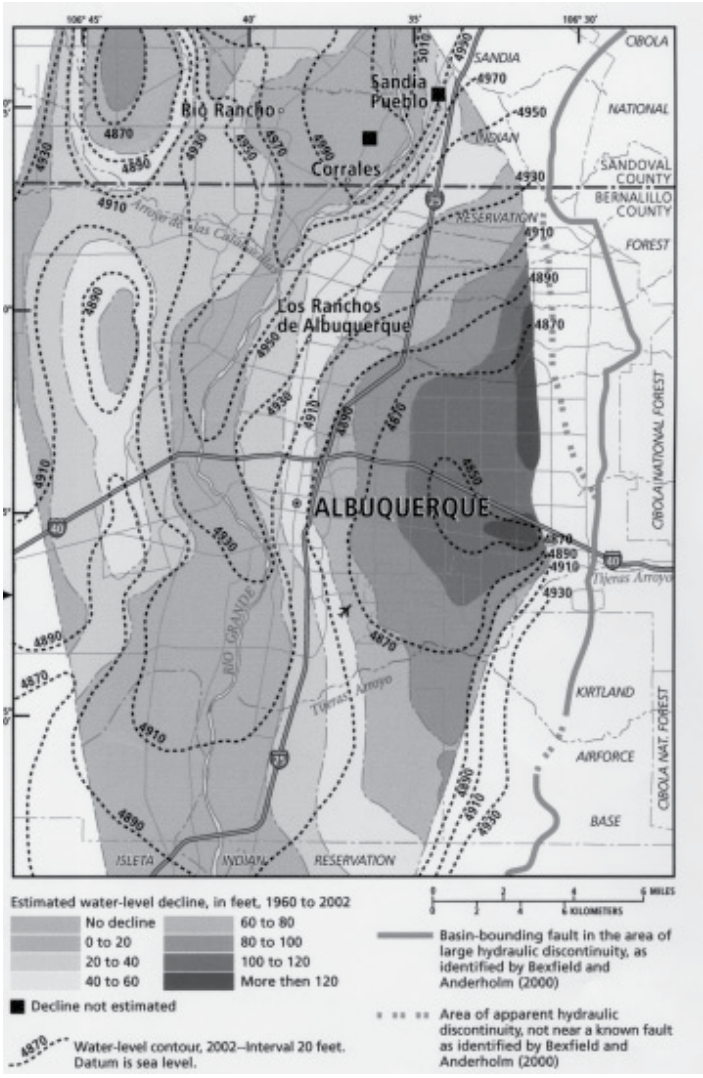


Map 2

Update of adjacent citation: Middle Rio Grande Ecosystem Bosque Biological Management Plan The First Decade: A Review & Update.

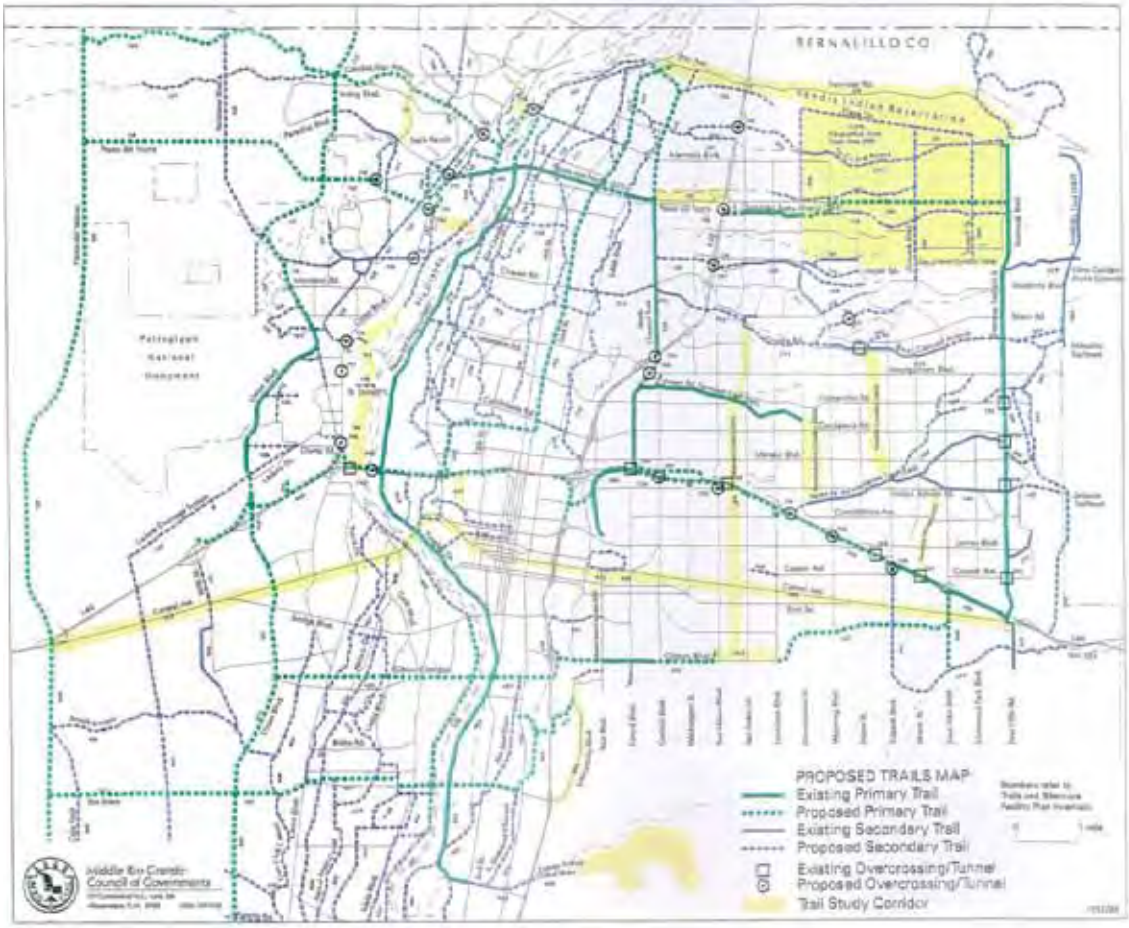
Robert, Lisa, prepared in cooperation with the Middle Rio Grande Bosque Initiative and the Bosque Improvement Group. Albuquerque, 2005.

"The sound-bite version of what needs to be done? Protect the existing levees but remove jetty jacks wherever you can. Level off the banks wherever possible to facilitate overbank flooding. Get peak flows back up, with a flood every three to four years. Look for places to return sediment to the system. Thin the riparian forest—remove non-natives and even dying cottonwoods—and open it up to native cover like saltgrass. It would also be good to identify potential wet meadow areas, and eventually do moist soil management up and down the valley." (Paul Tashjian, Hydrogeologist, U.S. Fish & Wildlife Service, personal communication, 2002.)



Trails & Bikeways Facility Plan.

City of Albuquerque. Albuquerque, NM: 1993.



Bosque Landscape Alteration Strategy: Objectives, Basic Requirements And Guidelines.

Middle Rio Grande Conservancy District, Yasmeen Najmi and Sterling Grogan and UNM Department of Biology, Cliff Crawford. Albuquerque, 2005.

Objectives

1. To reorganize the Rio Grande bosque's landscape to retain, within current constraints, including institutional and water supply constraints, its historical processes and wildlife communities.
2. To recreate, by doing this, its former patchy mosaic of native trees and open spaces along the present-day river's narrow floodplain, while containing the distribution of invasive species.
3. To reduce, by having created this mosaic, the intensity of bosque wildfires both at the wildland-urban interface and within the rest of the bosque, and water depletion by the bosque landscape.

Example of Mosaic in Restored Area
Bosque del Apache National Wildlife Refuge
Photo by: Gina Dello Russo, BDANWR

New Mexico Nature Center
State Park Management Plan 2010

New Mexico State Parks Division, Energy, Minerals, and Natural Resources Department. Santa Fe, NM: 2010.

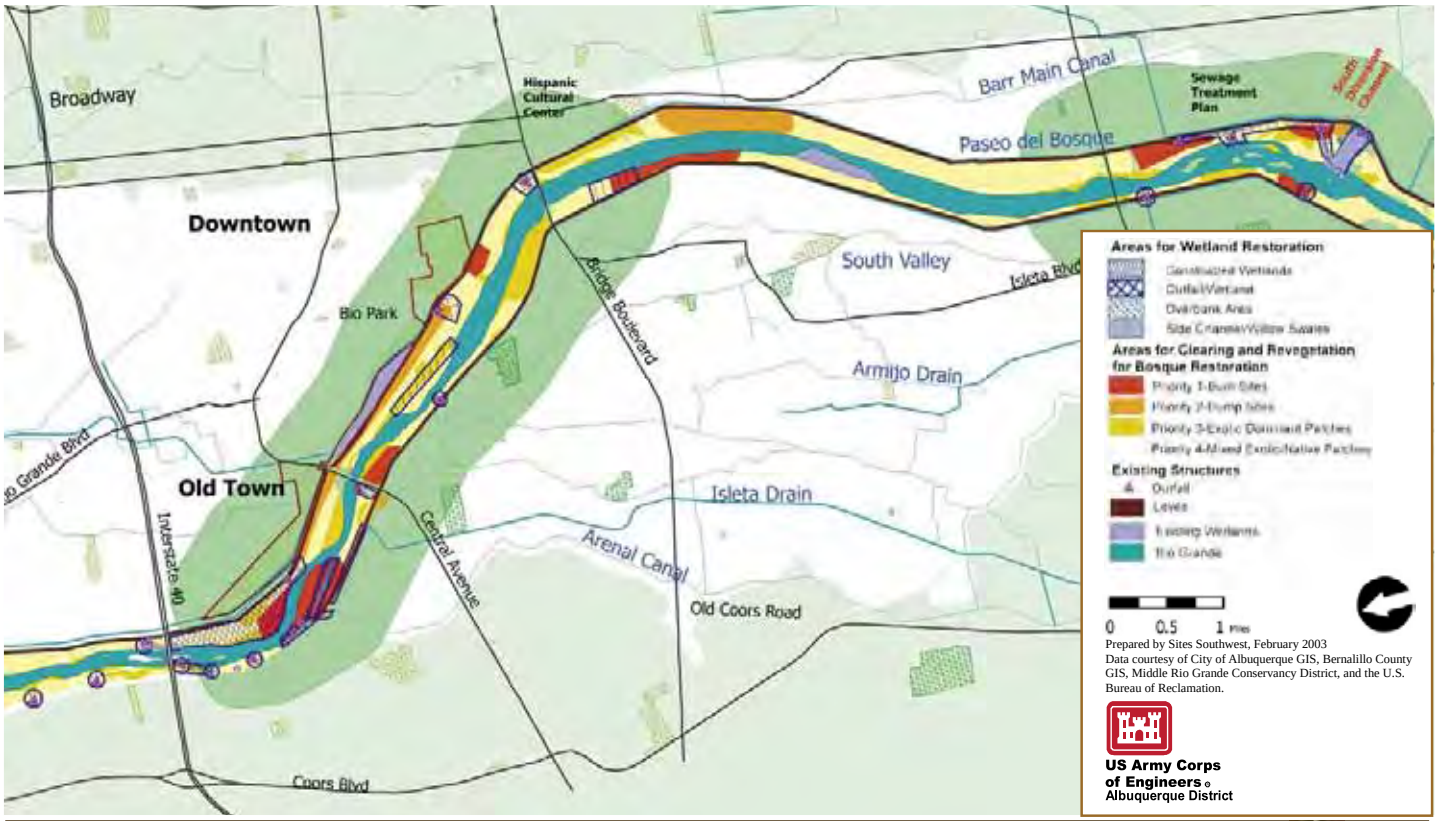
Reining in the Rio Grande, People, Land, and Water.

Phillips, Fred M., and G. Emlen Hall, and Mary E. Black. Albuquerque: UNM Press, 2011.

Bosque Restoration Middle Rio Grande Reconnaissance Study, Section 905(b)
Analysis & Supplemental Planning Document.

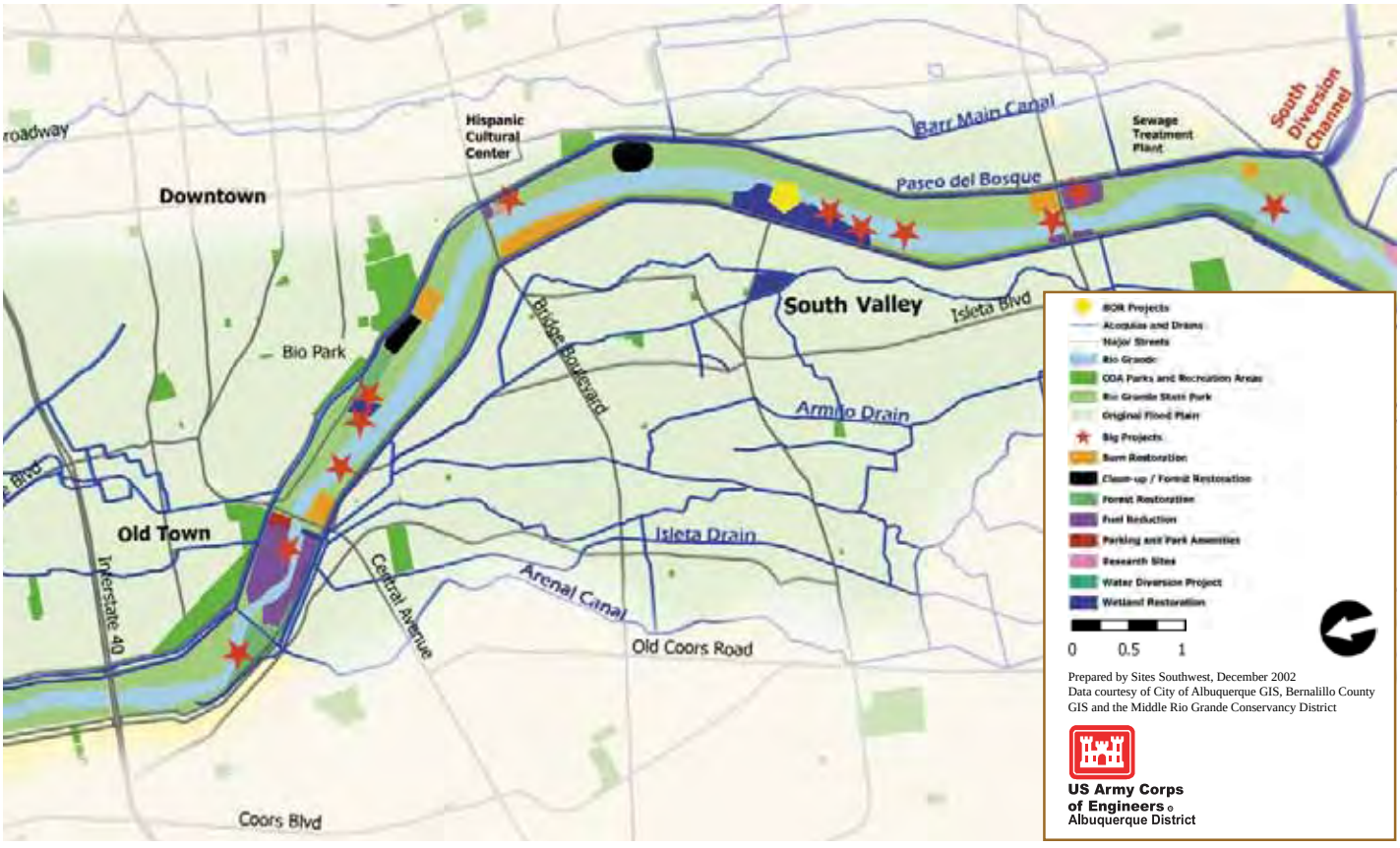
Sites Southwest and Bohannan Huston Inc. for U.S. Army Corps of Engineers. Albuquerque, New Mexico: 2002.
http://www.bosquerevive.com/recon/905b-reconrpt.pdf & http://www.bosquerevive.com/Recon/reports.htm

Figure 18. River Plan and Section



July 2003

Map 21 Restoration Opportunities for Further Study



User's Guide for the Rapid Assessment of the Functional Condition of Stream - Riparian Ecosystems in the American Southwest

Stacey, Peter B., Allison L. Jones, Jim C. Catlin, Don A. Duff, Lawrence E. Stevens, and Chad Gourley. Salt Lake City, Utah: Wild Utah Project, 2006. Website accessed 2012: www.unm.edu\biology\stacey.

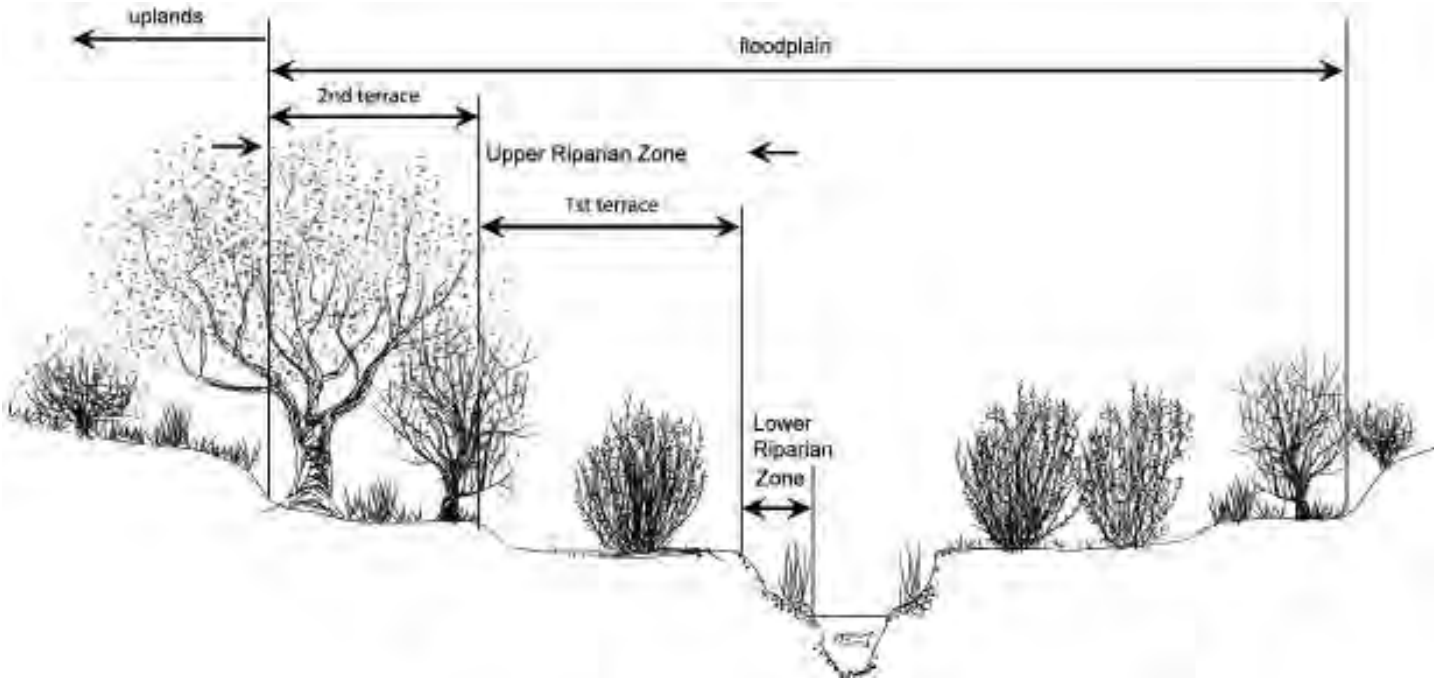


Figure 1: Idealized cross section of small and medium sized streams and their associated floodplains in the American Southwest. The scour zone, which is flooded during periods of peak runoff in most years, is also called the Lower Riparian Zone (LRZ), and is used for one of the vegetation transects in this protocol (LRZ transect). The areas of the flood plain that are outside of the scour zone are flooded only during increasingly rarer and increasingly higher flow events. The edge of the first terrace closest to the stream channel marks the inside edge of the Upper Riparian Zone (URZ) as used in this protocol, and a second vegetation transect (URZ transect) is established along this edge. *Illustration by Heidi Snell*

Final Albuquerque Comprehensive On-Street Bicycle Plan.
Transcore for City of Albuquerque. Albuquerque, NM: 2000.

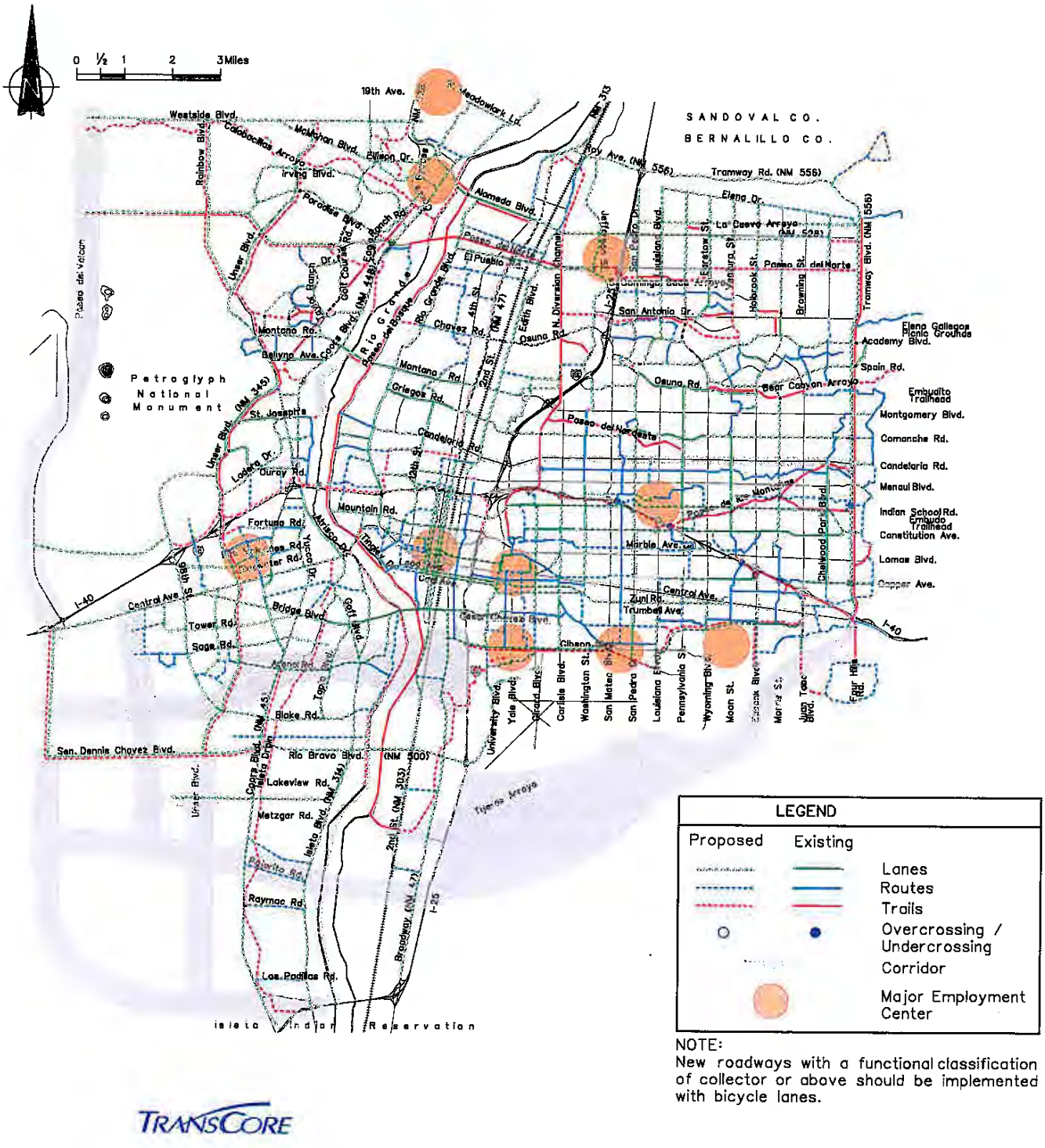


Figure 4-4, Recommended On-Street Bikeway Network

Desired future conditions for Southwestern riparian ecosystems: Bringing interests and concerns together, General Technical Report RM-GTR-272.

United States. United States Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. Albuquerque: 1995.
Website accessed 2012:
http://www.fs.fed.us/rm/pubs_rm/rm_gtr272.html

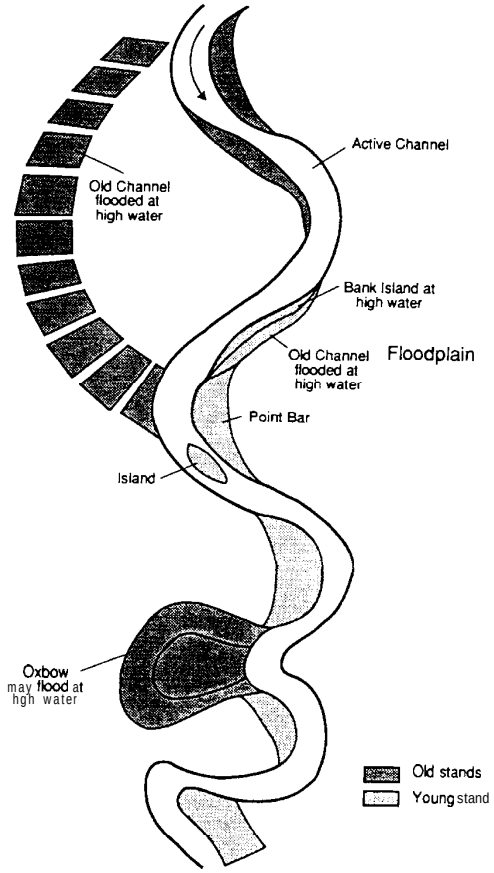
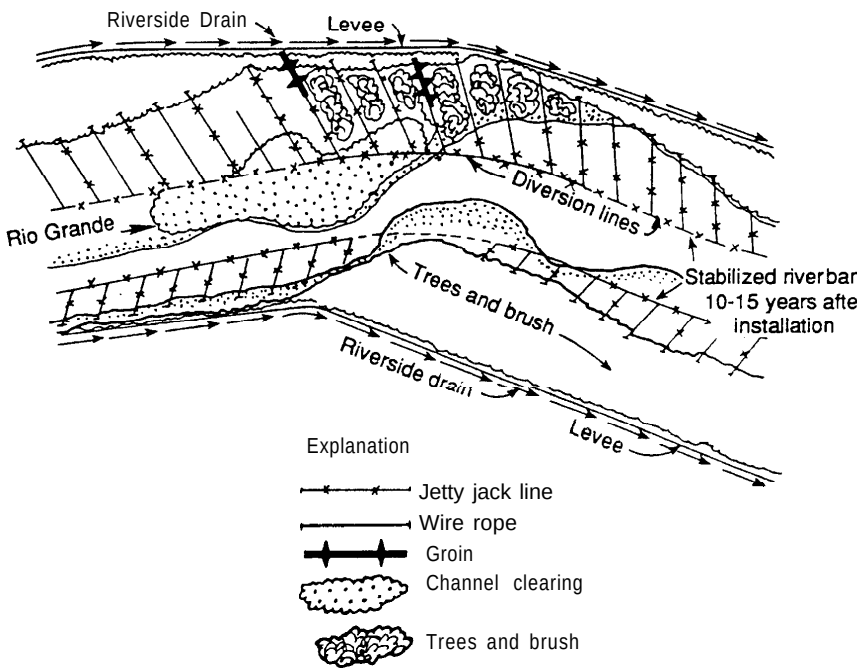
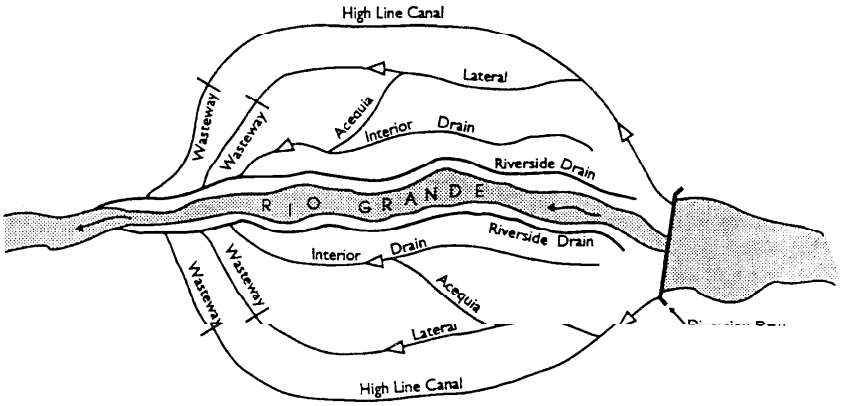


Figure 9. Zones of cottonwood and other riparian species establishment along an unmodified river (Crawford et al, 1993).



e 10. Channel stabilization works on the Middle Rio Grande (after Bullard and Wells, 1992).



igure 8. Schematic map of an irrigation network on the Middle Rio Grande (Bullard and Wells, 1992).

Report SRH-2011-03, Middle Rio Grande Endangered Species Collaborative Program River and Habitat Restoration Methods Workshop Middle Rio Grande Project, New Mexico, Upper Colorado Region.

United States. U.S. Department of the Interior, Bureau of Reclamation. Technical Service Center, Denver, Colorado: 2011.

- **Transition**

- Single channel
- Low sediment load (Jemez Canyon Dam)
- Gravel conversion
- Potential for more incision & lateral migration
- Upstream narrowing
- Downstream bar formation
- New restoration

Background: Geomorphology

Angostura to Isleta (210-169)

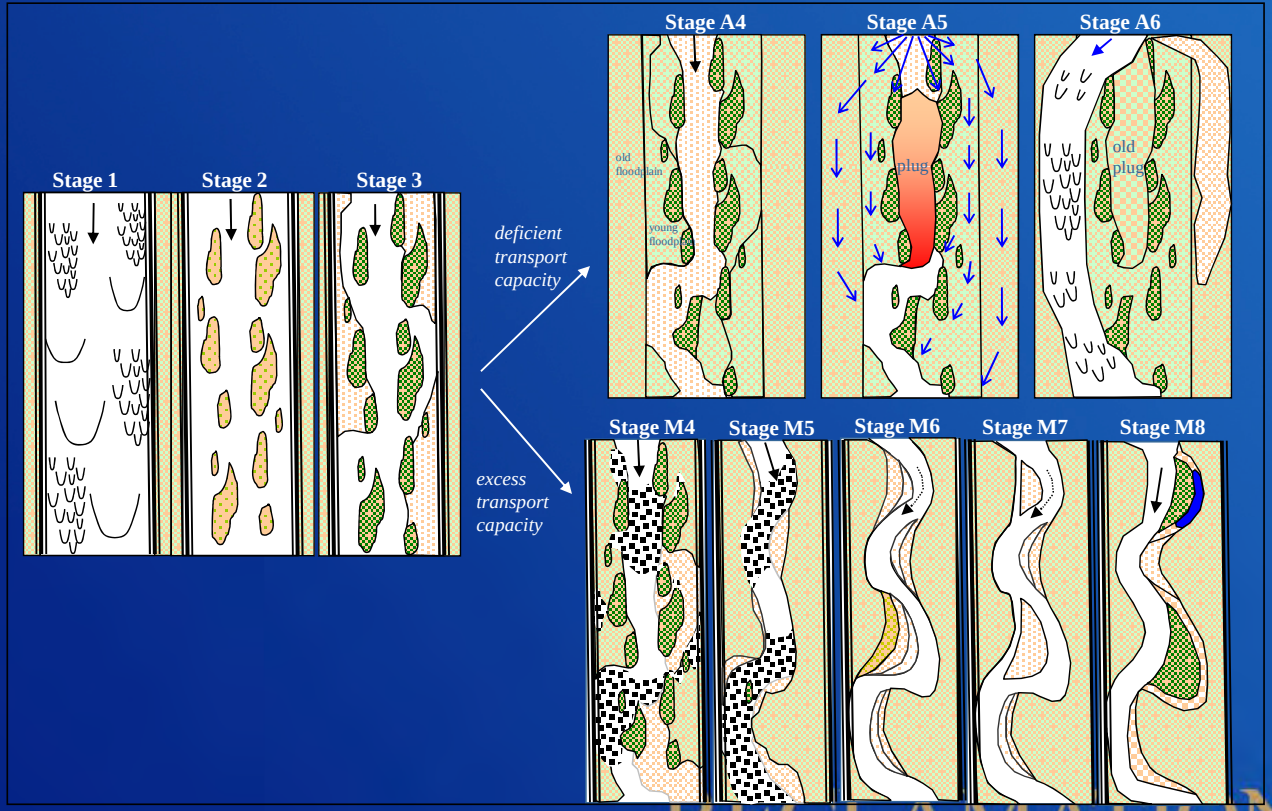
RECLAMATION

Conclusions

- Middle Rio Grande is a significantly managed river system.
- Rapid channel evolution began in the 1990s, complicating that management.
- Combining all the major channel features (narrowing, sedimentation, incision, and slope) has led to a planform evolution model that describes existing conditions and yields a more comprehensive method for future predictions of channel planform.
- 1D sediment modeling predicts significant channel degradation if Elephant Butte Reservoir remains below the Narrows.

RECLAMATION

Planform Cycle



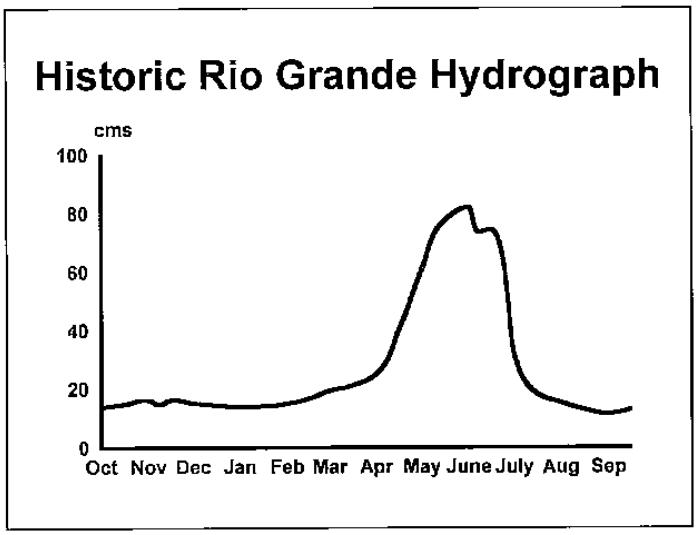
RECLAMATION

La Vida Del Río Grande, Our River – Our Life.

Vásquez, Carlos. Albuquerque: National Hispanic Cultural Center, 2002.

Excerpt: Water, Biology, and Legal Issues, Restoration and Monitoring on the Rio Grande, Cynthia Abeyta, Army Corps of Engineers

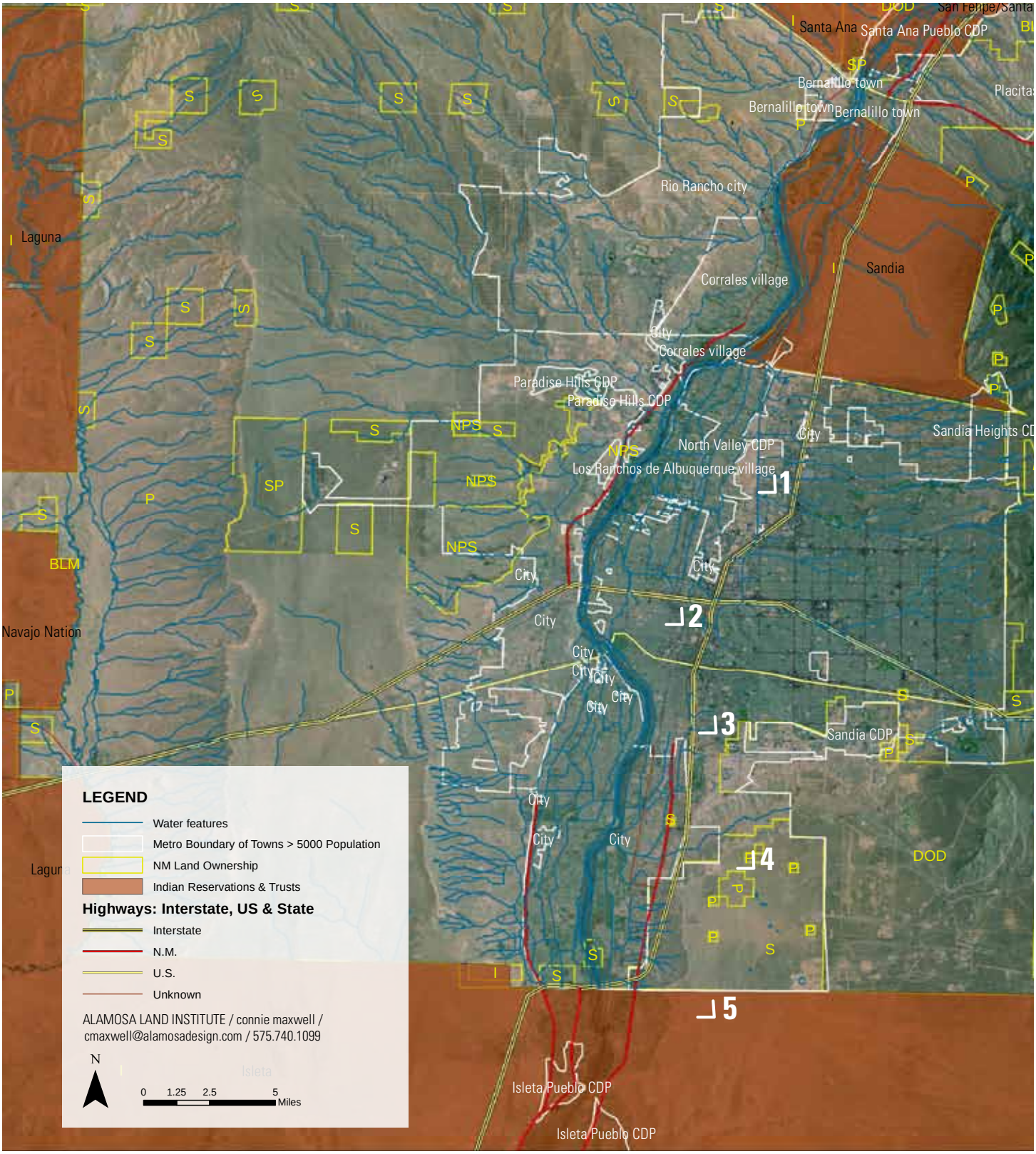
There is deep concern and interest about the preservation of the bosque. The bosque provides the foundation for agriculture as well as for many other vital activities. The bosque enhances the quality of our lives and our communities. Some of the questions asked in the early '90s were: What would central New Mexico be like without the river and its riparian areas? Would the community still exist? Would the area's history or the diversity of its people be as rich? What will the river and its bosque be like in the year 2000, and the year 2025 , and in the year 2050? It is very interesting to talk with people who have grown up along the bosque and see what the differences are forty to fifty years ago and today.



This is an historic hydrograph from the northern portion of the Río Grande in Embudo. It illustrates the peak floods and runoff in late May and early June.

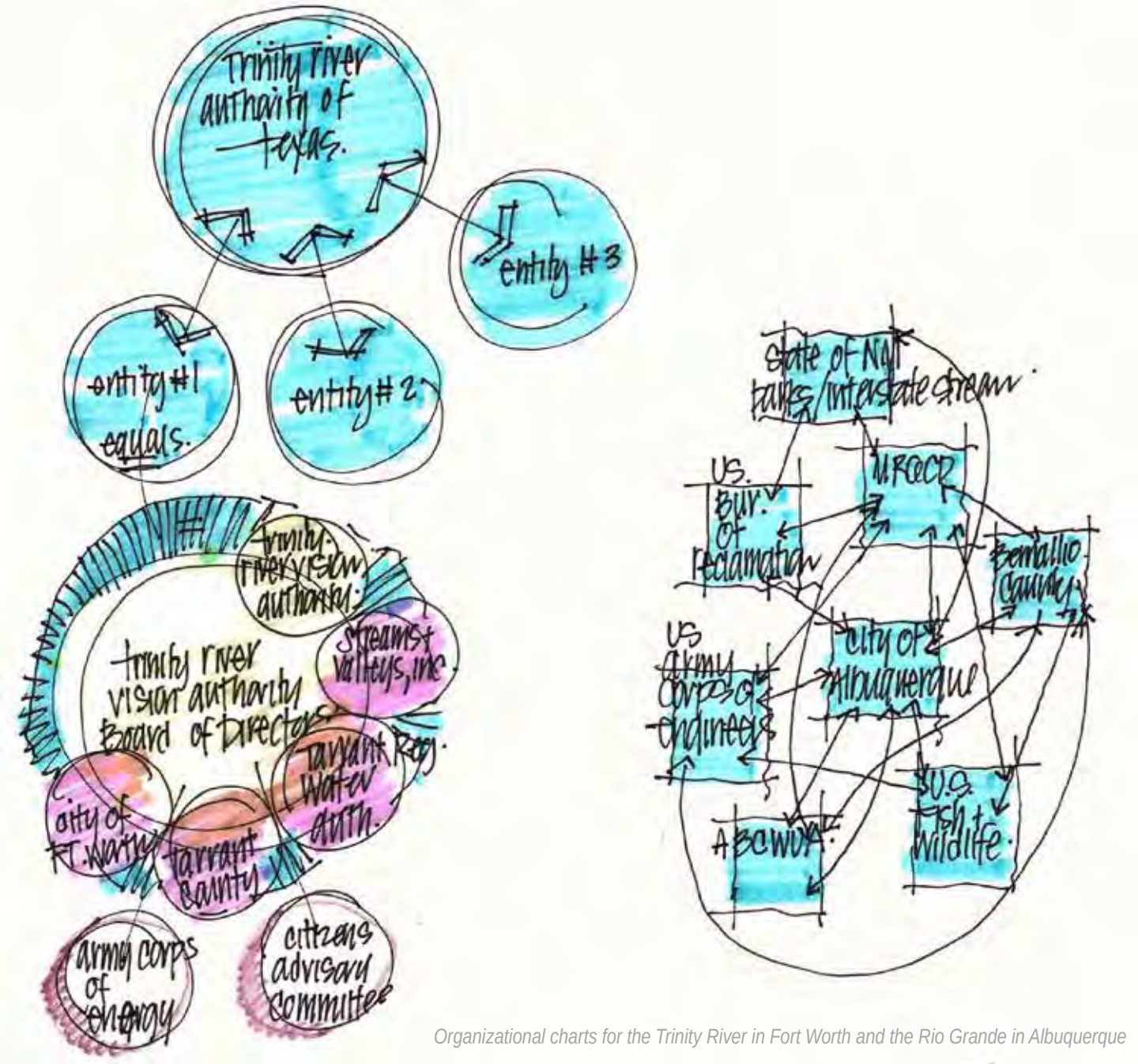
Mayor's 25-yr Rio Grande Plan (2011)

alamosa land institute preliminary maps



coordination and management

One of the greatest challenges for the Rio Grande is the lack of coordinated management and leadership. Land managers, government agencies and municipalities operate via partnerships with other land managers, agencies and municipalities. Partnerships change over time and by project, and there is no one group or entity that ensures activities are done in a coordinated manner. There is some sharing of information, but this is not consistent, and there are no established venues for all of the active players to develop things like best practices standards, education/conservation/recreation priorities, protocols for communications or schedules for coordinated construction. Additionally, there are disputes about land ownership and management/maintenance responsibilities among key land managers. Other river communities have empowered existing regional agencies or established authorities or partnerships that ensure that river projects and activities are planned, designed, funded and implemented in a coordinated manner. By the end of this project, we will present recommendations for how this might be done in Albuquerque.



Organizational charts for the Trinity River in Fort Worth and the Rio Grande in Albuquerque

river jurisdiction

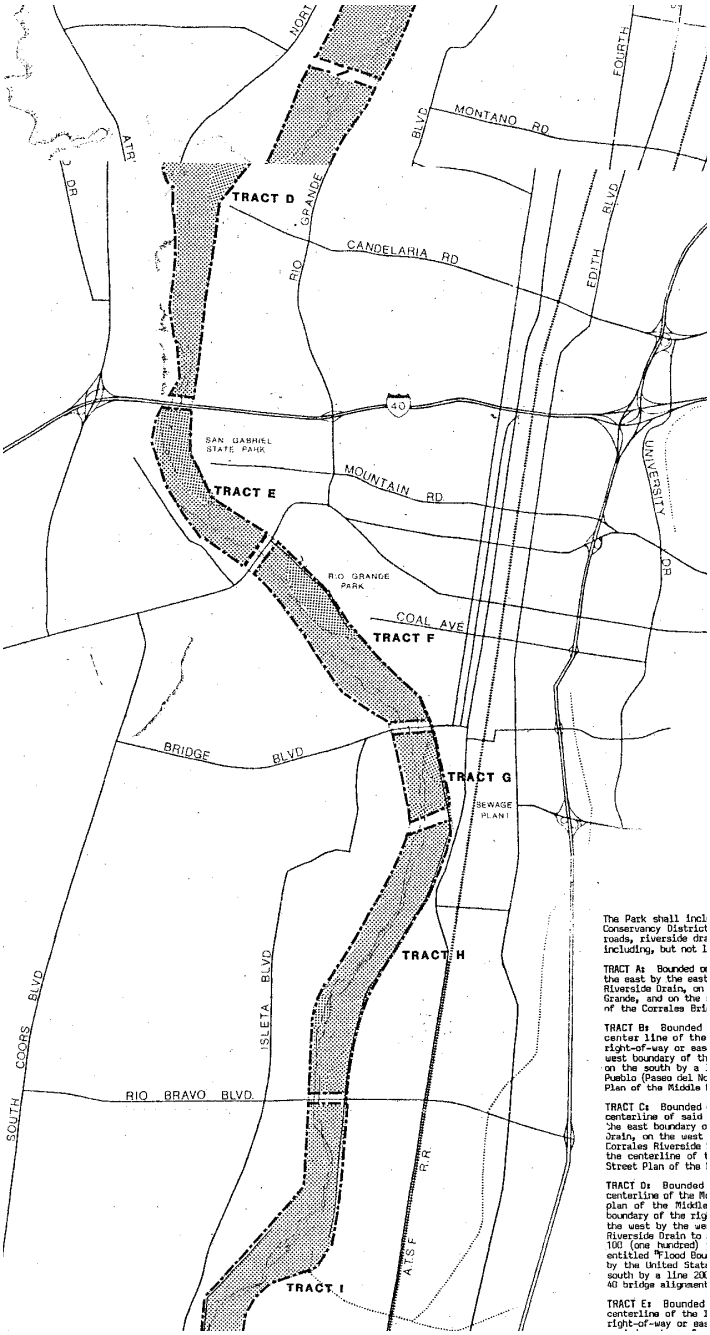
The number of land managers and stakeholders who have some level of river jurisdiction is large. The amount of intergovernmental overlap related to water supply, river activities, restoration, approvals, and ownership makes any kind of coordinated planning very challenging. That said, all of these entities have been working together in and around the Rio Grande Valley State Park since a management plan was put in place in 1987. Implementation of any improvements within or adjacent to Rio Grande Valley State Park will require support from the land managers and stakeholders of the area. Long term implementation of multiple projects along the corridor would be best served if there was oversight from a regional planning agency like the Middle Rio Grande Council of Governments (MRCOG) or a new River Authority or similar such entity.
All of the land managers for the Rio Grande in Albuquerque have either been interviewed during the research and analysis phase, or are serving on the project Steering or Technical Committees. These agencies/organizations include: City of Albuquerque, Bureau of Reclamation, US Army Corps of Engineers, Middle Rio Grande Conservancy District, Albuquerque Bernalillo County Water Utility Authority , U.S. Fish and Wildlife Services, and the Albuquerque Metropolitan Arroyo Flood Control Authority.

http://www.fws.gov/southwest/mrgbi/Resources/Dams/index.html

Water Storage and Water Demand

Water distribution and allocation protocols along the Rio Grande are both complicated and sophisticated. For the purposes of this document it is important to know that the water flow of the Rio Grande through Albuquerque is managed. Dams and reservoirs are controlled by several different agencies including the Bureau of Reclamation, the Middle Rio Grande Conservancy District, and the Corps of Engineers. In periods of drought, competition among water users is fierce. It is our understanding that the storage capacity of the watershed is extensive but perhaps not what it could or should be. Additionally, water demand and allocations are frequently higher than real water supply. Subsequently, in summer and times of drought, there may not always be enough water available to meet water obligations.

rio grande valley state park



from Rio Grande Valley State Park Management Plan, Albuquerque Parks & Recreation Department, Open Space Division, June 1987.

Rio Grande Valley State Park is managed cooperatively by the City of Albuquerque Open Space Division and the Middle Rio Grande Conservancy District (MRGCD). The 4,300-acre Rio Grande Valley State Park extends from Sandia Pueblo to Isleta Pueblo. The park was established by the State Legislature in 1983. The language in the designation of the Rio Grande Valley State Park allows people "...to enjoy the recreational, environmental, education and wildlife benefits of the river." The management agreement designates the City of Albuquerque as the "operating party" who's tasks include:

- Negotiation and execution of Joint Powers Agreement (JPA) among the Bureau of Reclamation, the MRGCD, NM State Natural Resources Dept. (now known as EMNRD) and CABQ. The JPA defines broad objectives of each management authority, identifies the need to incorporate recreational use and create a positive working relationship between parties.
- Development of a management plan. The Management Plan is a policy document that addresses the public need for recreational use of the Bosque, to specify uses which are appropriate in the Bosque and to provide for the protection of natural resources and wildlife habitat.
- Oversight of the Paseo del Bosque. The trail runs between Alameda Boulevard and Rio Bravo Boulevard. Bernalillo County is responsible for most maintenance south of Bridge Boulevard.
- Oversight and maintenance of the natural surface trails and unmarked trails in the Bosque on both sides of the river.
- Oversight of low impact activities such as hiking, bicycling, mountain biking, in-line skating and horseback riding. (from CABQ website and RGVSP Management Plan)

land/water managers

Bureau of Reclamation (BOR)
Mission: manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public

Projects: Albuquerque Area Office (AAO): Manages the Rio Grande Project which delivers water to irrigation districts in Texas and New Mexico, and municipalities in Texas, but also ensures that the requirements of the 1906 Treaty with Mexico and the Rio Grande Compact between the states of Colorado, New Mexico and Texas are honored. Reclamation projects include nine major dams with a combined reservoir storage capacity of more than 3,551,000 acre-feet. AAO also provides operation, maintenance, and oversight on four projects: the San Luis Valley Project, the San Juan - Chama Project, Middle Rio Grande Project, and Rio Grande Project. Also, participates in the Middle Rio Grande Endangered Species Collaborative program.

Other items of note: Owns and/or operates dams mentioned above - upstream facilities include Platoro Dam and Reservoir, Heron Dam and Reservoir, operator of El Vado Dam and Reservoir; created the Middle Rio Grande River Maintenance Program and Plan and has maintenance responsibilities for the Rio Grande; has extensive land holdings along the corridor (in dispute with MRGCD).

Corp. of Engineers (COE)
Mission: Civil works (related to water control, flood risk management, and recreation), emergency management, engineering and construction, environmental programs, and regulatory programs and permits.

Projects: Owner of water model: Upper Rio Grande Water Operation Model- used to simulate processes and operation of facilities and complete calculations for delivering water from Colorado to texas; provides data on reservoirs and streams; federal sponsor of bosque restoration projects and responsible for design and construction of these efforts; Middle Rio Grande Flood Protection Project- working with MRGCD to start a $1 million study of rebuilding levees from Bernalillo to Belen; participates in the Middle Rio Grande Endangered Species Collaborative program.

Other items of note: Owns a lot of dams in NM. Upstream facilities include Abiquiu Dam and Reservoir, Cochiti Dam and Cochiti lake, Gallisteo Dam and Reservoir, Jemez Canyon Dam and Reservoir.

U.S. Fish and Wildlife (FWS)
Mission on the Rio Grande: “The U.S. Fish and Wildlife Service’s mission is, working with others, to conserve, protect and enhance fish, wildlife, and plants and their habitats for the continuing benefit of the American people.” (from FWS website). Additionally, the local unit has representatives of the National Wildlife Refuge System and their mission is to “ ...administer a national network of lands and waters for the conservation, management and where appropriate restoration of the fish, wildlife, and plant resources and their habitats within the United States...” (from Middle Rio Grande National Wildlife Refuge Environmental Assessment, Land Protection Plan, and Conceptual Management Plan)

Projects: Valle del Oro National Wildlife Refuge; monitoring and managing efforts related to the Endangered Species Act; and data collection and management related to conservation of migratory bird populations and habitats; participation in the Middle Rio Grande Endangered Species Collaborative program.

State of New Mexico and Rio Grande Nature Center State Park (RGNCSP)
Mission: The Rio Grande Nature Center State Park’s mission is to “...preserve and protect the Rio Grande bosque, to educate the public about Rio Grande ecosystems, and to foster positive human interactions with those systems.” (from Friends of the Rio Grande Nature Center web site)

Other items of note: Per the management agreement the State of NM is the “owner” of the State Park. The state also participates in the Middle Rio Grande Endangered Species Collaborative program.

Albuquerque Bernalillo County Water Utility Authority (ABCWUA)
Mission: To assure responsive Customer Service; provide reliable, high quality, affordable and sustainable water supply, wastewater collection treatment, and reuse systems; and support a healthy, environmentally-sustainable, and economically-viable community.

Projects: participates in the water operations calls; monitors 404 permits and is starting mitigation projects related to the biological opinion from U.S. Fish and Wildlife; and provides community education related to water. The recently constructed drinking water diversion dam, created to provide water for Albuquerque, is a major impediment to recreational padding/rafting in the Rio Grande in Albuquerque.

RECLAMATION
Managing Water in the West

Albuquerque Area Office
Technical Services Division
River Analysis Group
March 20, 2008

Montaño

Background
The Montaño site is located on the east bank of the Rio Grande, approximately 3,000 feet upstream from the Montaño Bridge. The bankline is about 100 feet from the toe of the levee. The east bankline has not moved significantly since before 1962, but the channel in this reach has narrowed substantially in recent years, and it appears that a meander bend is developing at the site location. The channel had previously been straight.

Potential Impacts
Failure at this site would occur through migration of the eastern bankline, damaging the levee. This could result in river flows entering the drain and flooding of adjacent residential areas.

Discharge of Concern
Erosion damage at this site is most likely to occur during sustained moderate flows (2,000 to 5,000 cfs) or at high flows (above 5,000 cfs). The probability of erosion will increase as the bar opposite the site becomes more vegetated and stable.

Project Information
<Where does this site rank? Have decisions been made to move this site up on the working schedule?>

Approximate Coordinates
UTM83 (Zone 13N, meters)
Easting: 347840
Northing: 3891208

Monitoring Information
Aerial Monitoring: 2007
Ground Monitoring: March 2008
Data Collection:

Schedule (Completion Dates)
Data Collection:
Engineering Analysis and Design:
Receipt of Permits:
Construction Start:

Engineering Analysis
None to date.

Compliance Information
None to date.

Middle Rio Grande Conservancy District (MRGCD)
Mission: The Middle Rio Grande Conservancy District offers irrigation, flood control and responsible water conservation services to irrigators and farmers in the middle agricultural region of the state to ensure the Middle Rio Grande basin remains a viable agricultural community within the State of New Mexico. A secondary mission for MRGCD facilities is to provide for recreational activities and opportunities.

Projects: Middle Rio Grande flood Protection Project- working with USCOE to start a $1 million study of rebuilding levees from Bernalillo to Belen. Project may cost $400-500 million; local sponsor of bosque revitalization efforts if cooperation/coordination with the Corp. of Engineers (Bosque revitalization I project:$25 million 3-year, 900 acre, bosque restoration project – sponsoring agency, From north Sandia Pueblo to isleta Pueblo/ Bosque revitalization @ Rt. 66: @2 million, 643 acres (273 acres within the bosque and 370 acres in the active river channel)

Other items of note: along with the Bureau of Reclamation and the Corp. of Engineers, the MRGCD also owns dams and diversions along the Rio Grande. The facilities up river from ABQ are the El Vado Dam and reservoir (water storage for irrigation , recreation, flood control, and sedimentation control) and the Angostura diversion Dam (diversion and delivery of irrigation waters). MRGCD also controls/owns irrigation ditches and irrigation water conveyance structures along the river, and has extensive land holdings along the river corridor (in dispute with BOR).

City of Albuquerque
Mission: City of Albuquerque's Open Space Division works to acquire and protect the natural character of land designated as major public Open Space. These lands, which are comprised of over 28,000 acres in and around Albuquerque, are managed to conserve natural and archaeological resources, provide opportunities for outdoor education, provide a place for high and low impact recreation, and define the edges of the urban environment. The Open Space Division manages Rio Grande Valley State Park and provides education and law enforcement services in the park.

The mission of the Cultural Services Department is to "...enhance the quality of life in the City by celebrating Albuquerque's unique history and culture, and providing services, entertainment, programs and collections that improve literacy, economic vitality and learning in state of the art facilities that enrich city life and increase tourism to Albuquerque." (from NEA grant announcement). The Albuquerque Museum, the ABQ BioPark, and the local government access channel are just a few of the facilities and programs within the department.

regulations

The following regulations appear to have the greatest impact on the ability to make quality of life improvements at the river corridor – in the river, adjacent to the river and overlooking the river. These are really big all encompassing regulations that impact the river system. Other regulations and codes control site specific development, and as this project moves into concept development we will explore the ramifications of those regulations on a site by site basis.

Rio Grande Project

Authorized in 1905, the Rio Grande Project is an irrigation, hydroelectricity, flood control and water transfer project serving the upper Rio Grande basin. The project irrigates 193,000 acres along the river in New Mexico and Texas, as well up to 25,000 acres in Mexico.

The Rio Grande Compact

The Rio Grande Compact of 1939 apportioned water from the Rio Grande among Colorado, New Mexico, Texas and Mexico. Over the decades water allocations, water delivery, water demand, water availability and management of facilities has evolved. Drought management plans have also been created to provide fair delivery of available water, but there is fierce competition for the scare resource – including water required to comply with the requirements of the Endangered Species Act (see below).

Endangered Species Act

Most of the Middle Rio Grande land/water managers conduct business and operate in a manner that is a result of compliance with the Endangered Species Act. Activities that might result in a "taking" of any endangered species from a habit are not allowed. (From EPA website) Currently habitat for the SW Willow flycather and the Rio Grande Silvery Minnow, are the focus of mitigation and restoration efforts. In the Rio Grande corridor, the lead agency for implementing/monitoring compliance with the Endangered Species Act is the U.S. Fish and Wildlife Service. Activities such as water releases, restoration projects, access control, conservation efforts, etc. are geared toward preserving/ creating habitat for endangered species like the silvery minnow and the willow flycatcher.

Others

FEMA regulations for development within the 100 and 500 year floodplains and local regulations related to development in the flood plain may impact development opportunities and/or design of improvements along the river corridor.

constraints on development

The primary constraints on development are related to the sheer number of land/water managers – each with a different mission, and the lack of one authority to ensure coordinated implementation of activities and improvements. As was recommended in the Middle Rio Grande Conservation Initiative, restructuring of intergovernmental communication and collaboration is sorely needed to ensure well coordinated and complementary activities along the river.

Other constraints include:

Ownership: There is a lack of clarity on land ownership all along the corridor. Lands disputes are a barrier to implementation of new improvements in, adjacent to and overlooking the river.

Restoration: Even among the agencies that are leading habitat preservation/restoration work, there is disagreement about the best way to do this work, and on the extent of controls to public access and recreation that are needed to ensure that it succeeds. Additionally, where restoration is occurring in compliance with the Endangered Species Act, modifications to the areas are not recommended.

Bosque Wildland Urban Interface: There are direct conflicts between the need to create fire breaks in the bosque and the desire to reduce habitat fragmentation. There is disagreement about the manner in which fuel loads are being reduced and its long term impact on the bosque.

Habitat vs. People: There is disagreement about the appropriate and feasible balance between habitat preservation and human activities. Issues include the carrying capacity of certain landscape types along the river, the amount of buffering or depth required for certain habitat areas to continue to function, and the right approach for trails – create fewer soft surface trails to limit disturbance, or provide more soft surface trails to more equitably distribute demand along the system; limit the extent of paved trails or expand the use of paved trails and reduce the load on the Paseo Del Bosque trail.

funding opportunities

The *Middle Rio Grande Conservation Initiative* addresses funding as a critical part of the planning process for the Rio Grande corridor. Ideas from that effort as well as initial discussions specific to this project include:

- Form a non-profit Foundation associated with this project that will promote the Connect and Protect objectives and raise and direct funds to river-related improvements.
- Where feasible, use operating budgets, bonding capacities and new funding initiatives to generate funds for improvements.
- Consider a quality of life tax in both the City and the County that is directed to implementation of ABQ THE PLAN or river corridor projects.
- Target state funds from existing river–related programs to implement improvements.
- Increase the limit for USACE projects from 10% for recreation to 20%.
- Increase federal funding of programs that are integral to conservation, recreation and education on the Rio Grande.

Paseo del Bosque at the National Hispanic Cultural Center

River	250 acres
Lakes	285 acres
Meadow	780 acres
Wetland	300 acres
Woodland	215 acres
Parkland*	210 acres
Playing Fields	40 acres
Promenade	20 acres
Parkway	115 acres
Levee Park	85 acres
Total	**2,300 acres**

"The City of Dallas is reclaiming the Trinity River, building new bridges by Spanish Engineer Santiago Calatrava, providing for increased flood protection, creating a great public domain with recreational facilities and access to natural environments, and achieving a model of environmental stewardship while encouraging economic development. Not unlike the era of Frederic Law Olmstead more than a century ago, when cities created extensive park systems to mitigate the impact of industrialization, Dallas has embarked on an ambitious, environmental-enhancing project in the Trinity River Project."
Brad J. Goldberg

Charles Allen of Trinity River Expeditions says upgrades are helping Dallas sites see the Trinity in a new light.

"The river's bad reputation has kept people away from it for a long, long time, but that's really helped protect the wildlife, the archaeological sites and historic sites and all the other good things about the river." Allen continues, "I would like for more people to come down to the Trinity River and learn more about our natural heritage. I'd like people to have a sense of ownership about the river. Because this IS our river, and it IS our natural heritage."
Wallace, Roberts, Todd, Landscape Architects.

trinity river project, dallas, texas






Boulder Creek- Boulder, Colorado

The Boulder Creek Watershed is located in the Front Range of the Colorado Rocky Mountains. The watershed offers an excellent opportunity to evaluate the effects of natural processes and human activities on a river system, because it flows from protected mountain headwaters through a progressively more urbanized region to a dominantly agricultural landscape. The USGS has performed several studies to develop a better understanding of the Boulder Creek Watershed.

boulder creek, boulder, colorado

Animas River Walk- Farmington, NM
The Animas River Walk is a 6 mile trail system along the Animas River in Farmington, New Mexico. Two thirds of New Mexico surface water flows through the Farmington area at the confluence of the Animas, San Juan, and LaPlata Rivers.

For many years Farmington relied on the water for its growth as an agricultural town, though in recent years energy resources have taken a leading role. Several donations of land along the river corridor have helped create a scenic and relaxing trail in the main market town in the Four Corners.

Todd Lochmoeller: http://4cornershikesnavajo.blogspot.com/2011/01/animas-river-walk.html

animas riverwalk, berg/animas trail,farmington, new mexico







Cherry Creek and Platte Rivers- Denver, Colorado

One of the glories of Denver is its public park system, the largest in the country. With 200 parks and 650 miles of bike and pedestrian trails connecting the city's neighborhoods, its possible for pedestrians and cyclists to enjoy nature and avoid automobile traffic all along Cherry Creek, shown on the left, to Confluence park, where Cherry Creek meets the South Platte River. It's even possible to raft and kayak right through the heart of the city.

cherry creek and platte rivers, denver, colorado







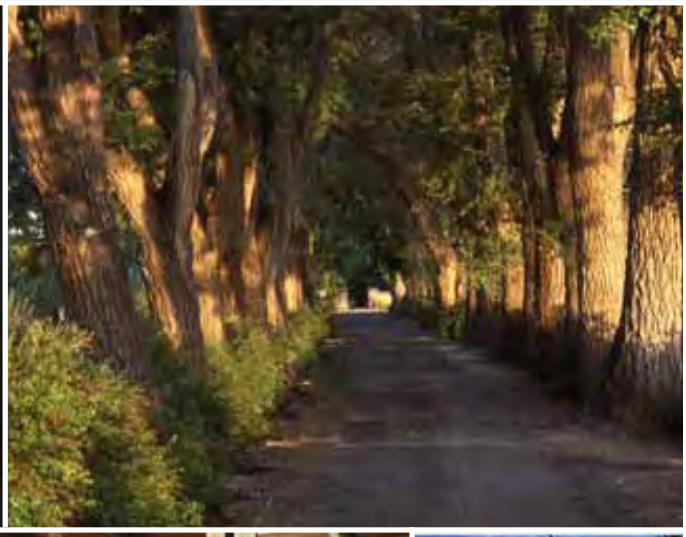

Boise River Greenbelt- Boise, Idaho

The 22-mile Boise River Greenbelt is one of Boise's most beloved parks. The tree-lined pathway follows the river through the heart of the city and provides scenic views, wildlife habitat and pedestrian access to many of the city's popular riverside parks. The Greenbelt also serves as an alternative transportation route for commuters... Up until the 1960s, the river and its banks served as a convenient dumping ground for trash, industrial waste and raw sewage, and was severely degraded by years of neglect... In 1968, with public interest and support growing, the first Greenbelt Plan and Guidelines were adopted by the Board of Parks Commissioners... Today, the Greenbelt is maintained by the Boise Parks & Recreation Department. We work closely with land owners and other public agencies to expand and improve the existing pathway. *City of Boise, http://www.cityofboise.org/departments/parks/parksandfacilities/parks/page18151.aspx*

boise river greenbelt, boise, idaho









los poblanos historic inn and cultural center, albuquerque, nm

Los Poblanos Historic Inn and Cultural Center-
Albuquerque, New Mexico

Our mission is to cultivate a conservation ethic by preserving the agricultural fields, formal gardens, and the important New Mexican art and architecture of the Historic Los Poblanos Ranch through sustainable practices. We are attempting to achieve this by perpetuating the agricultural history through farming organic produce and lavender; using the residence as a small country inn; and using the cultural center for its original intended use of hosting meetings, parties, and cultural events.

Today ... Our plan has been designed with the help of some of the leading preservationists and planners in the country, including the National Register of Historic Places and the New Mexico Register of Historic Places. It was modeled after other successful preservation projects of historically significant properties. The essence of our plan has not changed and centers on preservation of the agriculture, the architecture, the gardens and history.

Agriculture: Los Poblanos is again a model experimental farm raising organic produce, organic lavender, and honey bees. The lavender farming is part of a village and state driven sustainability initiative to create a high-margin crop with very little water use.

La Quinta Cultural Center - Re-opened on a very limited basis for its original intended purpose: as a quasi civic art community center. We currently host meetings and retreats for civil, social, and cultural purposes. It is also available for historical, architectural, and educational tours.

Los Poblanos Ranch House - Operates as a historic inn serving breakfast using fresh organic ingredients from the farm. It has been voted “Best B&B in New Mexico” by several publications and continues to receive glowing reviews from press and guests nationally.

Gardens - The historic gardens designed by famed landscape architect Rose Greely are being maintained and rehabilitated with special consideration to water conservation.

Education - In addition to the educational tours and agricultural programming, Los Poblanos remains dedicated to higher education and learning in New Mexico. Through strategic partnerships, educational programming, internships, and charitable events, Los Poblanos has contributed to elementary and post-graduate education, including University of New Mexico, New Mexico State University, and Central New Mexico Community College (formerly TVI)

Los Poblanos seen here is a potential development model providing a gateway to the Rio Grande.













Hyatt Regency Tamaya Resort & Spa-
Santa Ana Pueblo, New Mexico
Website: This most unique resort, envisioned by the Pueblo of Santa Ana themselves, showcases the Tamayame's love for hospitality and their respect for nature. From authentic tribal experiences to the most indulgent of natural herbal spa treatments, challenge yourself to a round of championship golf, surrounded by historical monuments and breathtaking scenery, ride our gentle horses through the same terrain explored by the Tamayame for centuries, take in the astounding view of the Sandia Mountains from an incredible hot air balloon.
Bosque Restoration Division: see next page

tamaya resort & spa, hyatt regency
santa ana pueblo, new mexico

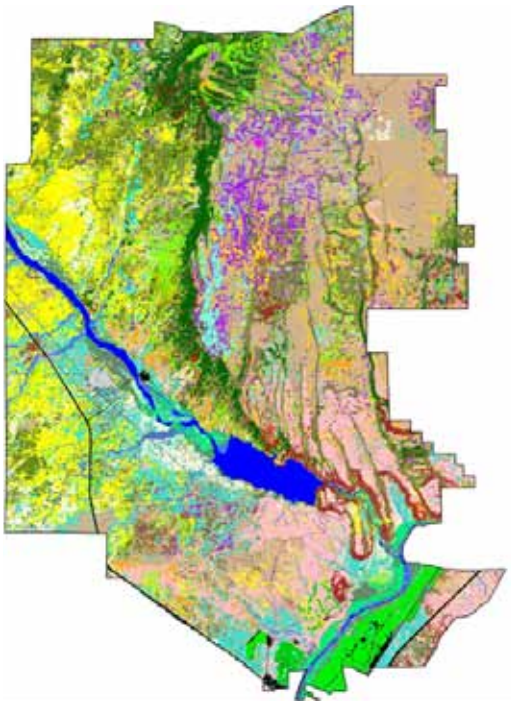








bosque restoration division, santa ana pueblo, new mexico



Bosque Restoration Division- Santa Ana Pueblo, New Mexico

Since 1998, the Pueblo of Santa Ana has worked to restore the riparian and riverine ecosystems along the Rio Grande within the reservation. The Rio Grande holds great economic, environmental, cultural, and aesthetic significance, not only for the native communities who have lived here for millennia, but for all New Mexicans. Sixty years of flood control and channelization projects on the Middle Rio Grande have significantly changed the character of the Rio Grande flood plain on the Pueblo, which have negatively impacted the riparian and aquatic communities. The Pueblo has implemented an ecosystem-based restoration program, designed to reverse these trends and restore a healthy, functioning Rio Grande ecosystem. Restoration activities are implemented to restore the river channel, active floodplain and the historic floodplain. Today, people throughout the Middle Rio Grande Valley look to the Pueblo of Santa Ana for guidance on how to restore and manage their lands. Program Highlights include:

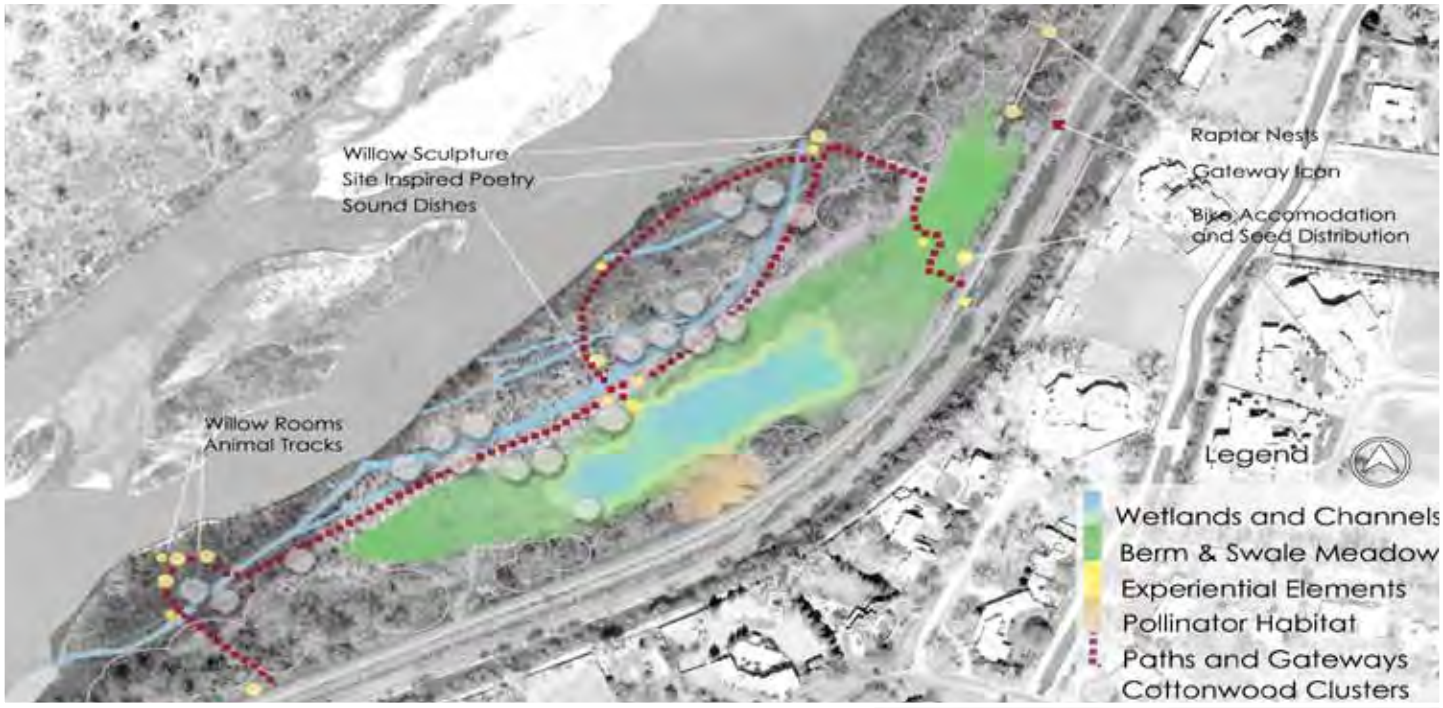
- Creating over 100-acres of riparian wetland habitat;
- Restoring the 6-river miles of the Rio Grande traversing through the Pueblo;
- Restoring 1300-acres of cottonwood bosque by clearing saltcedar and Russian olive thickets; and
- Restoring native wildlife habitat throughout the Santa Ana Rio Grande Bosque.

The Restoration Program provides these benefits to the Pueblo and the entire Middle Rio Grande Valley:

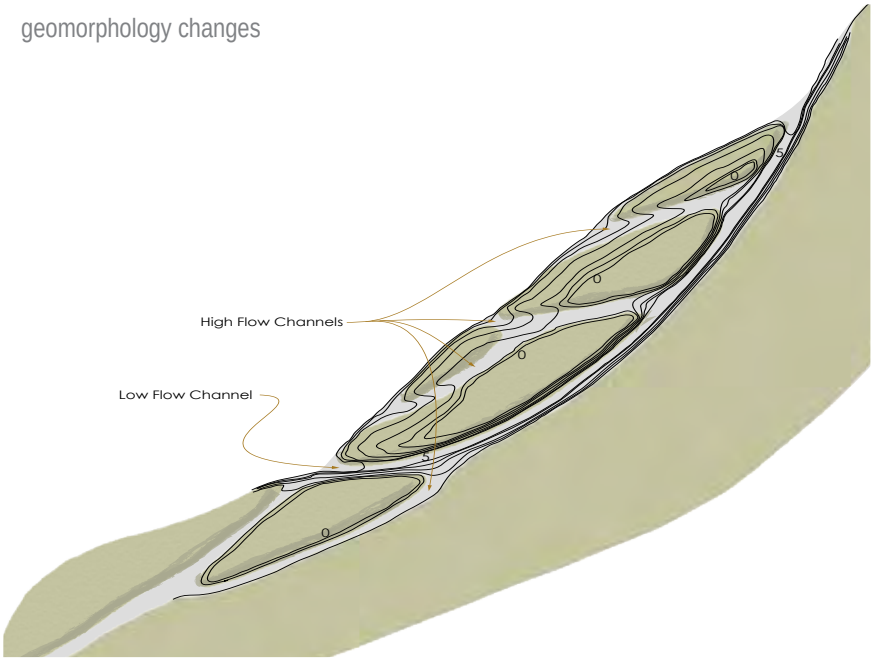
- Preserves the bosque for cultural and recreational uses by tribal members and guests.
- Reduces the risk of wildfire and protects the Pueblo's residential communities and economic interests.
- Preserves water resources by protecting further declines in the groundwater table.
- Enhances economic development (Hyatt-Tamaya) and provides employment for tribal members.
- Provides habitat for the endangered Rio Grande Silvery Minnow and the Southwest Willow Flycatcher.
- Openings created in the bosque enhance wildlife habitat for all species utilizing the Rio Grande corridor.

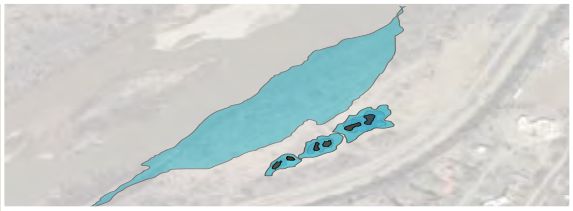
Although the Pueblo of Santa Ana has committed a significant amount of tribal resources towards this project, the work could not be completed without the financial and technical support provide by our partners. The Pueblo's partners include:

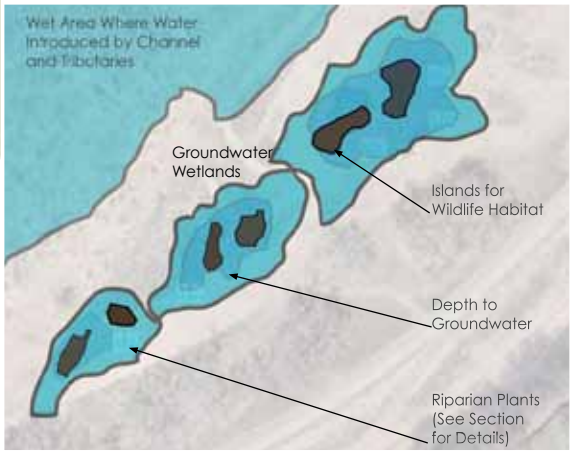
- U.S. Army Corps of Engineers,
- Bureau of Indian Affairs,
- Bureau of Reclamation,
- Fish & Wildlife Service,
- Ducks Unlimited (North American Waterfowl Conservation Act)
- National Fish & Wildlife Foundation
- Environmental Protection Agency
- Hyatt Regency Tamaya Resort



geomorphology changes







Experiential Willow Rooms

Interconnected and interwoven into the Bosque

Live Willow Sculpture and Bank Stabilizer

Intriguing and aesthetically pleasing spaces for human interaction while stabilizing banks to prevent erosion. Live willow sculptures potentially act as nesting habitat for birds, including the endangered Southwestern Willow Flycatcher.

David Goslina

Patrick Dougherty

Poetry - The Language of Conservation

An initiative to deepen the understanding of environmental issues through the use of poetry on benches and within willow rooms.

Parabolic Sound Reflectors

Bicycle Accommodations

Bosque Animal Tracks

One of the most important transforming concepts for the Albuquerque Bosque is to create a place for positive human interaction within the natural environment. To help people begin to perceive the Bosque as a natural habitat for wild animals, we suggest the implementation of wild animal tracks in the form of molds.

Indigenous animals to the Bosque
Canadian Geese
Sand Hill Crane
Blue Heron
Roadrunner
Coyote
Beaver
Porcupine

Seed bomb dispenser:

Purple Aster, Desert Marigold, Rocky Mt. Beeplant, Plains Coreopsis, Broom Dalea, Mexican Gold Poppy, Firewheel, Blanketflower, Blue Flax, Desert Four O'Clock, Mexican Evening Primrose, Sand Penstemon, Pink Wild Snapdragon, California Bluebells, Mexican Hat and Yellow Prairie Coneflower.

Rio Grande Bosque Restoration and Educational Park Theoretical Project- University of New Mexico

Professors: Catherine Page Harris, UNM Assistant Professor Art and Ecology; Dr. Peter Stacey, ALI / UNM Biology Professor; Bosque restoration and educational park project favorably received by the Army Corps of Engineers. Completed: 2011.
Stacey and Harris taught the UNM class "Aesthetics in Sustainable Landscapes", which successfully conveyed the ecological systems in the Bosque and their ongoing human input requirements: getting water onto the floodplains, harvesting the water coming in from rain, and replanting riparian vegetation. The students designed a park that showcases and educates the public about these systems, their methods of restoration, and provides a venue for natural public art.

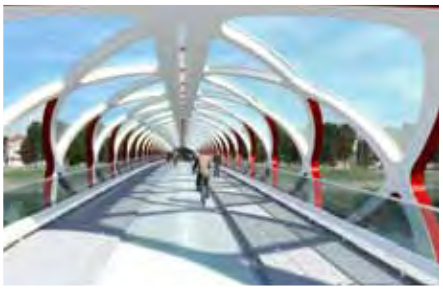
rio grande bosque restoration and educational park theoretical project university of new mexico class

portugal, sendero del pinar de la algaida

portugal, passadico de sao martinho

elements: pathways / boardwalks

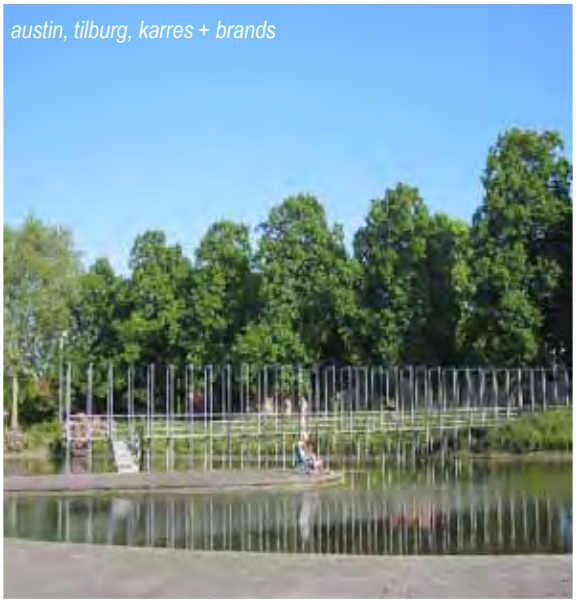

singapore, telok blangah hill park




santiago calatrava calgary peace bridge


kurilpa solar powered bridge


langkawi sky bridge

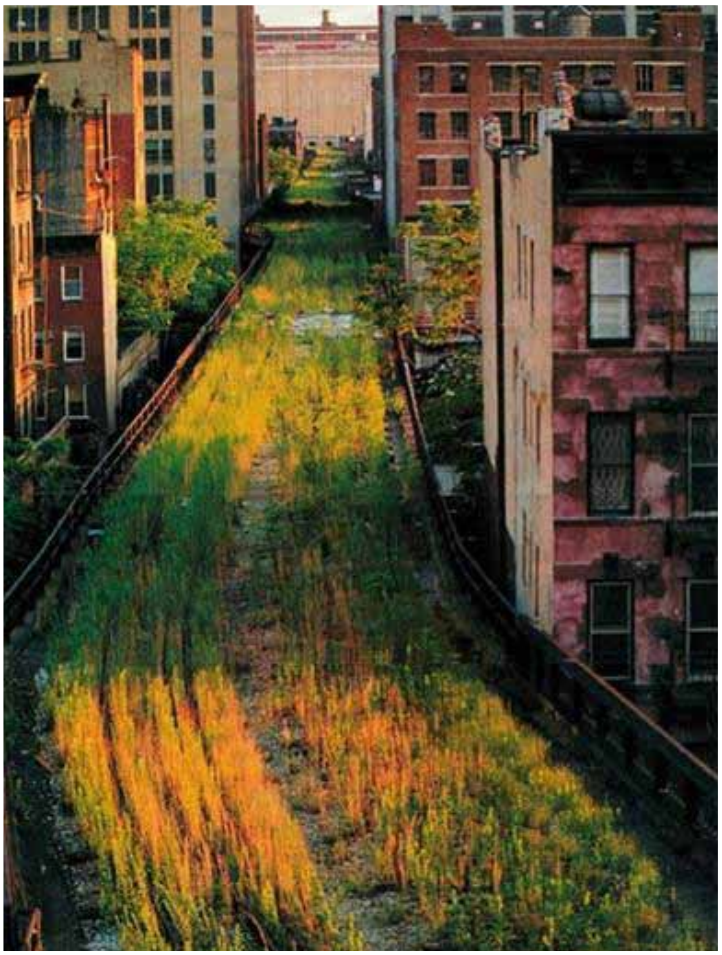

austin, tilburg, karres + brands


austin, pedestrian bridge, miro rivera architects

elements: pedestrian bridges

Spain, del garraf, vall d'en joan waste dump restoration project

elements: adaptive re-use of brownfield site



elements: adaptive re-use of old railroad bridge

england, A8, by NL architects

houston, tx, buffalo bayou, swa group

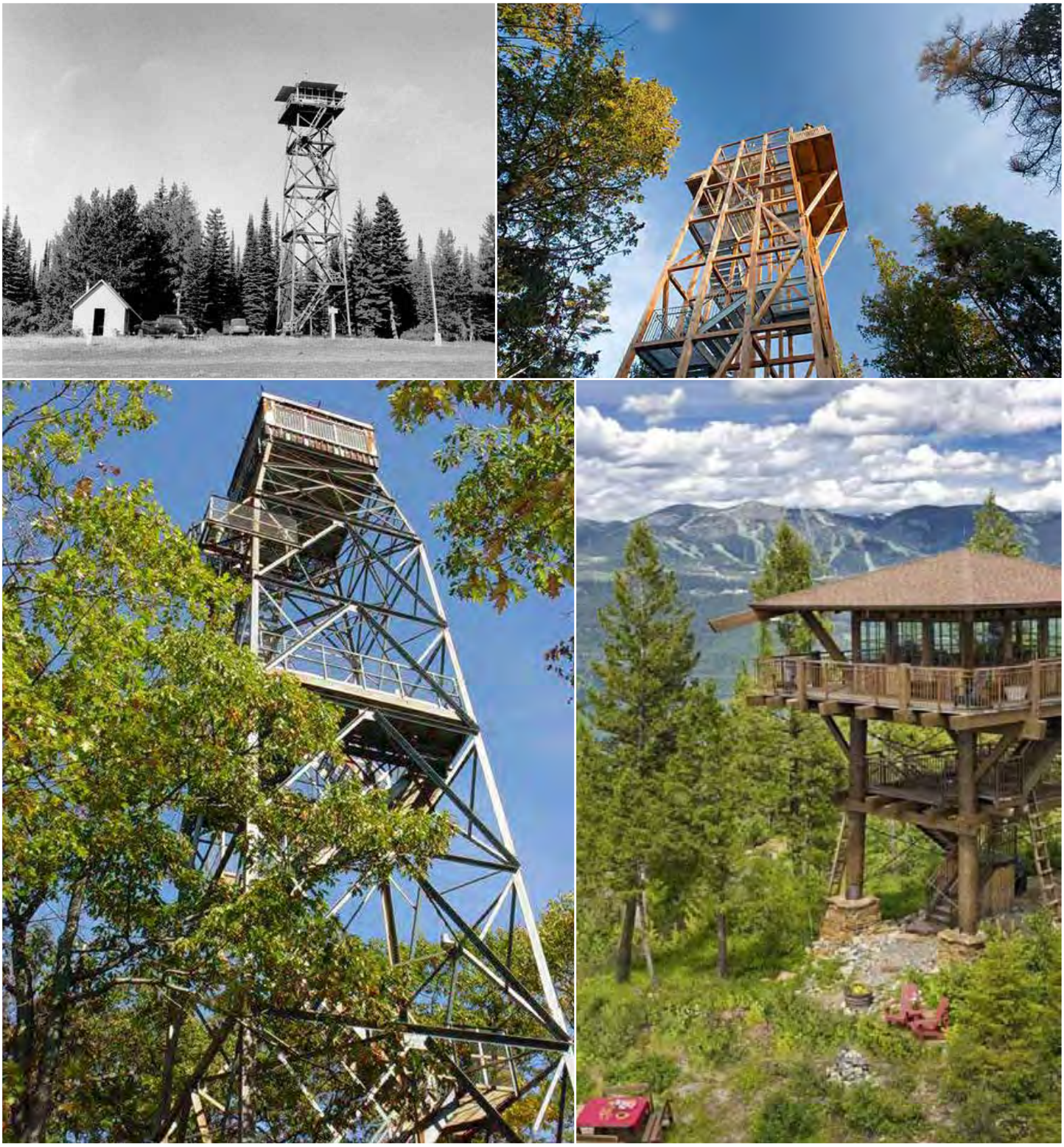
mecanoo, utrecht, faculty building

portland, oregon, burnside skatepark, burnside bridge

elements: adaptive re-use: below-bridge improvements

elements: observation / science towers


3gatti.com



original form and new interpretations - fire tower

fragileshelter, by hidemi nishida

van der merwe miszewski treehouse

pawleys island boat houses, north causeway

vhouse, legler


amsterdam, kraanspoor, office building, oth ontherpgroep trude hooykaas


hotel, endmico, gracia studio


spread house

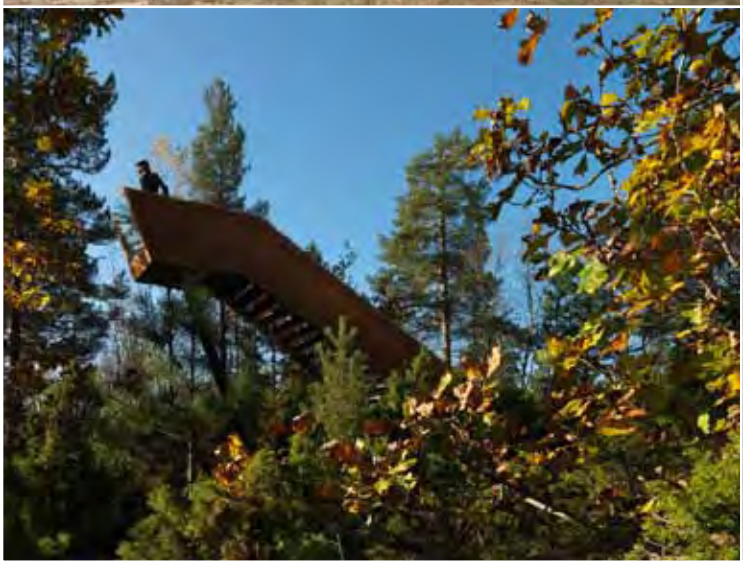

olson kundig architects, prefab sol duc cabin


great barrier island house

elements: raised structures

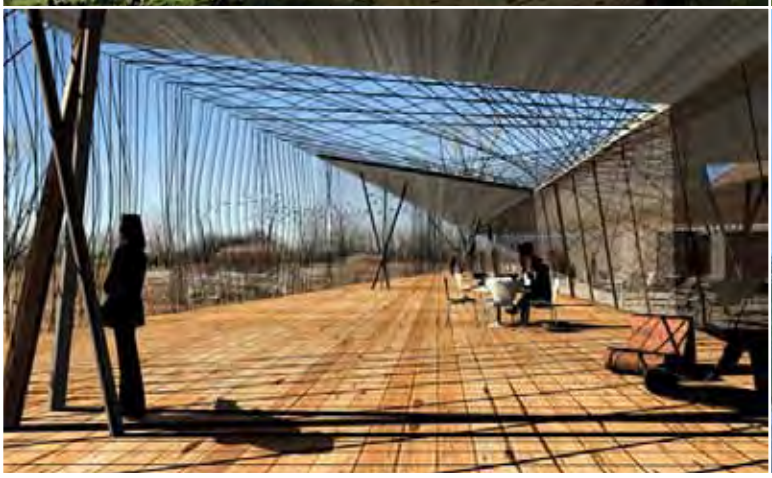











forms coming off of berm


leaf house


monohedron prefab house, andrej cverha


cocoon emergency shelter, woods bagot


leaf house

elements: floating structures or structures that rise with floods


poetic cosmos of the breath, tomas saraceno


wdc helsinki 2012 pavilion, aalto university

elements: temporary or removable structures


ar che aqua float home, steeltec


canadian muskoka boathouse


watervilla de omval, +31 architects


olympic bmw pavilion, serie architects


boat house, suthhussey

france, harness lagoon system

wetland / restored-landscape parks


douglas hollis, a sound garden, 1983


patrick dougherty, so inclined


interpretative methods


marie-line van vuuren


nils-udo


dimitri xenakis, gravité

art

interpretative walks

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